

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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## Flight.

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## EDITORIAL COMMENT.

The Government and the *Daily Mail* Competitions.

A development has arisen in connection with the two competitions for one of which the *Daily Mail* has provided the finance—the "Aerial Derby" and the race round Britain—which can only be described as astounding. To all intents and purposes this development means that the Government has interfered to prevent the races being held! What appears to have happened is this. It is a matter of common knowledge that the Government, under the powers conferred by the Aerial Navigation Acts, has scheduled certain areas as "prohibited" to airmen, and so far as the fundamental object lying behind the regulations themselves is concerned, we are in entire accord with the authorities. But it is one thing to make regulations which may on occasion be invaluable, and quite another to enforce them in a manner that is simply ridiculous. This, apparently, is precisely what the Home and War Offices are doing.

On Saturday next was to have been held the "Aerial Derby" round London for the gold cup presented by our contemporary, but at the eleventh hour the Home Office authorities have stepped in and forbidden the race,

because, forsooth, the route crosses the Thames, which is one of the "prohibited" areas. Now, it is within the powers of the Home Office to grant exemptions, and we take it that every effort has been made to secure a temporary relief from the operation of the regulations, for the *Daily Mail* alleges specifically that exemption has been refused. What possible reason, save that of official crassitude, can be at the back of the Home Office attitude passes comprehension. The race was held last year and created an enormous amount of public interest—which is what is required from every point of view at the present juncture. From the national standpoint it is quite essential that the public should have brought home to it the immense potentialities of the aeroplane as a weapon of offence and defence, and that can only be achieved through the medium of actual, practical demonstration in the air. Nothing better than this aerial race round Greater London could possibly be imagined, so far as concerns this particular aspect of the matter. At a moderate estimate it afforded an opportunity last year for a couple of millions of people to actually witness a number of aeroplanes in flight. Every one of these people must have gone home—or all of them who were capable of serious thought, at least—with the serious conviction that at last the aeroplane was a really practical proposition, and that those on the inside of things, who were urging that the time had come when we as a nation must have provision for our defence from attack through the air, were talking whereof they knew. No finer educational spectacle could have been devised. Now, simply because the route crosses the river at Purfleet, the Home Office says "No" to the whole thing! We confess we are entirely at a loss to understand the true inwardness of it all.

If this is bad there is even worse to follow. It seems to be more than likely that official action will prevent the holding of the race round Britain for the £5,000 prize offered by the *Daily Mail* for competition between hydro-aeroplanes. As our contemporary points out, the authorities have "prohibited" every place on the south coast which is suitable for the building and development of hydro-aeroplanes. The whole of the Solent, with Southsea, Portsmouth, Southampton and Cowes is wiped off the map, so far as flying is concerned. Plymouth, Devonport, Weymouth and Dover are all "prohibited." The starting-point of a race on a great scale, such as the *Daily Mail* round-Britain contest, continues the *Mail*, must have a large area of sheltered water, and must be

in the immediate neighbourhood of a large town. Otherwise the work of tuning-up, repairing and testing the machines, cannot be completed without long delays after even the smallest mishaps. All of which is very true.

The Royal Aero Club had proposed Southampton as the starting place for the race, but the War Office maintains its prohibition of all the places mentioned, even if the race is restricted to British pilots! Was ever such fatuous ineptitude? Southampton being barred by the War Office, we read that the Club suggests that the Thames Estuary should be the point for the start, but in the light of the Home Office attitude with regard to the Thames it does not seem the least bit certain that the river will be any more available than Southampton Water. Whether it is the Home Office or the Admiralty which exercises jurisdiction in the estuary we are not certain at the moment of writing, though for the sake of the success of the race we trust it is the Admiralty, from whom we should expect a more reasonable interpretation of the regulations governing flying around the coasts of these islands. Apparently, however, each of the three departments—the Home and War Offices and the Admiralty—has *something* to say with regard to all the prohibited areas, and this, naturally complicates the issues enormously, inasmuch as a separate set of negotiations has to be undertaken simultaneously with each. What infinite possibilities for official procrastination this seems to open out!

The *Daily Mail*, in its article dealing with the situation,



## The Aerial Royal Welcome Home.

As on the departure of their Majesties from these shores for Berlin, so on their return the officers of the Naval Wing of the Royal Flying Corps provided an aerial escort. One of the machines from the naval air station at the Isle of Grain met the "Victoria

sums up the matter admirably when it says that apart from the question of races, the British builder of aeroplanes and waterplanes is placed under a severe handicap. He may not build or test at any of the places most naturally suitable. There can be no aeronautical works in future on the Thames or the Solent, or at any place where the right kind of labour and material is best obtainable.

The Royal Aero Club, which has undertaken the organisation and arrangement of the circular race round Britain, is no doubt doing all that can be done to move the authorities from their present attitude, and will, we trust, succeed in securing some modification of the present impossible stand taken in official quarters. But whatever the result of the Club's efforts may be, the knowledge will still remain that so far from there being any disposition to encourage a very necessary industry, the official attitude is distinctly one of active discouragement, which is the less understandable when we remember the public utterances of those who stand at the head of the Government. Time and again have we been assured that the Government was entirely sympathetic to the movement and the industry; that it was fully appreciated that aerial defence was one of the pressing questions of the moment; and that the Government was quite alive to all the necessities of the case. And this is how the knowledge is applied—by the placing in the way of development of every conceivable obstacle by means of an attitude of *non possumus*.



and Albert" just off the Nore on Wednesday of last week, while a Short tractor biplane from the Naval Flying School at Eastchurch circled around the Royal Yacht as it was approaching the pier at Port Victoria. The two naval aeroplanes carried out a number of evolutions, and one flew over the Royal train as it steamed out of the station.



Lieut. von Hiddessen on his D.F.W. monoplane on which he won the three days' "Prince Henry Reliability Trials." The machine is constructed by the "German Aircraft Works" at Leipzig.

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**FLIGHT**

## OF MOMENT IN THE WORLD OF FLIGHT. Pilot-Constructors.



Mrs. HILDA B. HEWLETT and Mr. GUSTAVE BLONDEAU, constituting the firm of Hewlett and Blondeau. Mrs. Hewlett, who obtained her *brevet* under the instruction of Mr. Blondeau, afterwards taught her son, who is now an officer in the Royal Flying Corps, the art of flight.



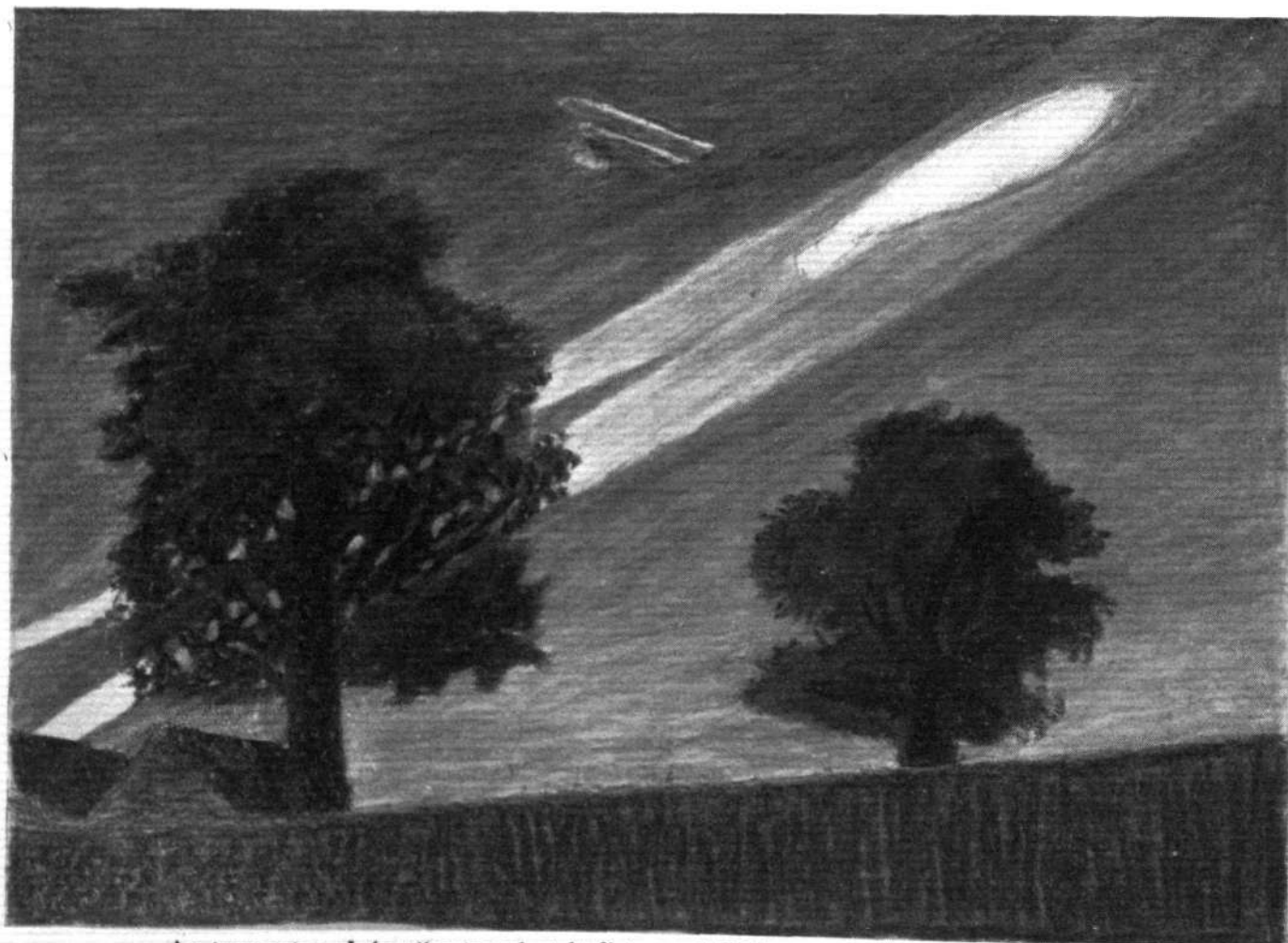
## FLYING AT HENDON.

THE first night flying demonstration held in the summer season took place on Thursday of last week and included some novel items. Early in the evening numerous exhibition and passenger flights were made, the machines looking very fascinating in the semi-darkness and against the rose-tinted western sky, especially the Handley Page monoplane, which, under the pilotage of E. Whitehouse, put up some good passenger work. Two excellent flights were made by E. Cheeseman on the 35-h.p. Anzani-Blériot monoplane, and Gustav Hamel took up a passenger on the 2-seater Blériot, after which he made a solo flight on the single-seater. J. L. Hall was also out on his 50 h.p. Blériot, getting in some very creditable "stunt" flying. On one occasion he made a flight accompanied by Capt. Tyrer, who sat up on the fuselage immediately behind Hall; the machine carried its extra weight in good style, and did not appear to have any difficulty in rising. R. Slack, also on a Blériot, and Jules Nardini on his 50-h.p. Gnome-Deperdussin monoplane, both made a flight each, whilst Louis Noel and Marcus D. Manton were busy testing the G.-W. machines prior to their nocturnal duties. In the meanwhile the enclosures were being illuminated by hundreds of small fairy lights, and the pylons were also lit up. Shortly after 8.30 p.m., Claude Grahame-White made a flight on the 50-h.p. Grahame-White biplane, which was decked out with a number of tiny electric lamps, arranged along the leading edges of the planes, and on the outriggers; port and starboard lights were also carried. Current for these lamps was supplied by a battery of C.A.V. accumulators carried on the machine. The next flight was made by Louis Noel on the G.-W.-Maurice Farman biplane, and Marcus D. Manton followed him shortly after on the 50-h.p. Grahame-White biplane; both machines were illuminated as previously described. Noel and Manton flew several circuits of the aerodrome, frequently switching their lights off so that the machines almost completely disappeared in the darkness, and then switching on again, re-appearing where one least expected to see them. Several such flights were made by these pilots until nearly ten o'clock, the movements of the machines being followed by powerful searchlights,

which were mounted on the hangars. Capt. Penfold, the Australian aeronaut, then ascended in his balloon, and after igniting some coloured signal lights, descended in his parachute, landing safely in the aerodrome. After this Joseph Wells and Sons gave a firework display, and at the same time the Willows "dirigible," illuminated by electric lights, made its way across the aerodrome with all the searchlights centred upon it. It was "diriged" by means of a motor car and tow-ropes, but, nevertheless, looked very realistic as it circled about. Louis Noel ascended in the Maurice Farman biplane, and flew round about the airship. This last bit was quite the most striking event of the night, the smoke from the fireworks, which still hung about the aerodrome, adding a finishing touch to the picture. While the airship was being docked, Jules Nardini came out on his 50-h.p. Deperdussin monoplane, which was brilliantly illuminated, and made a splendid flight, finishing up with an excellent landing. He wound up the proceeding of the night with another flight shortly before 11 o'clock. Although a large number of visitors turned up, the attendance was not so large as on the last two occasions of night flying, owing no doubt, to the late hour at which it now gets dark.

### THE WILBUR WRIGHT MEMORIAL DAY MEETING.

There was a great change in the weather conditions on Saturday last, for, besides being much colder, the wind was behaving in a very nasty manner, blowing at about 35 to 40 m.p.h. The cross-country handicap and the speed handicap down on the programme could not, therefore, be flown, but some very fine demonstrations of wind fighting were witnessed instead. Pierre Verrier, for instance, made a fine cross-country flight with a passenger on the Aircraft Co.'s 50-h.p. Maurice Farman biplane. He flew out to Harrow Church, round the spire and then back, being tossed about by the wind in an alarming manner. He made several other flights during the afternoon, some of which were with passengers. Louis Noel also took up several passengers on the G.-W.-Maurice Farman biplane, and later in the evening Claude Grahame-White, with Noel as

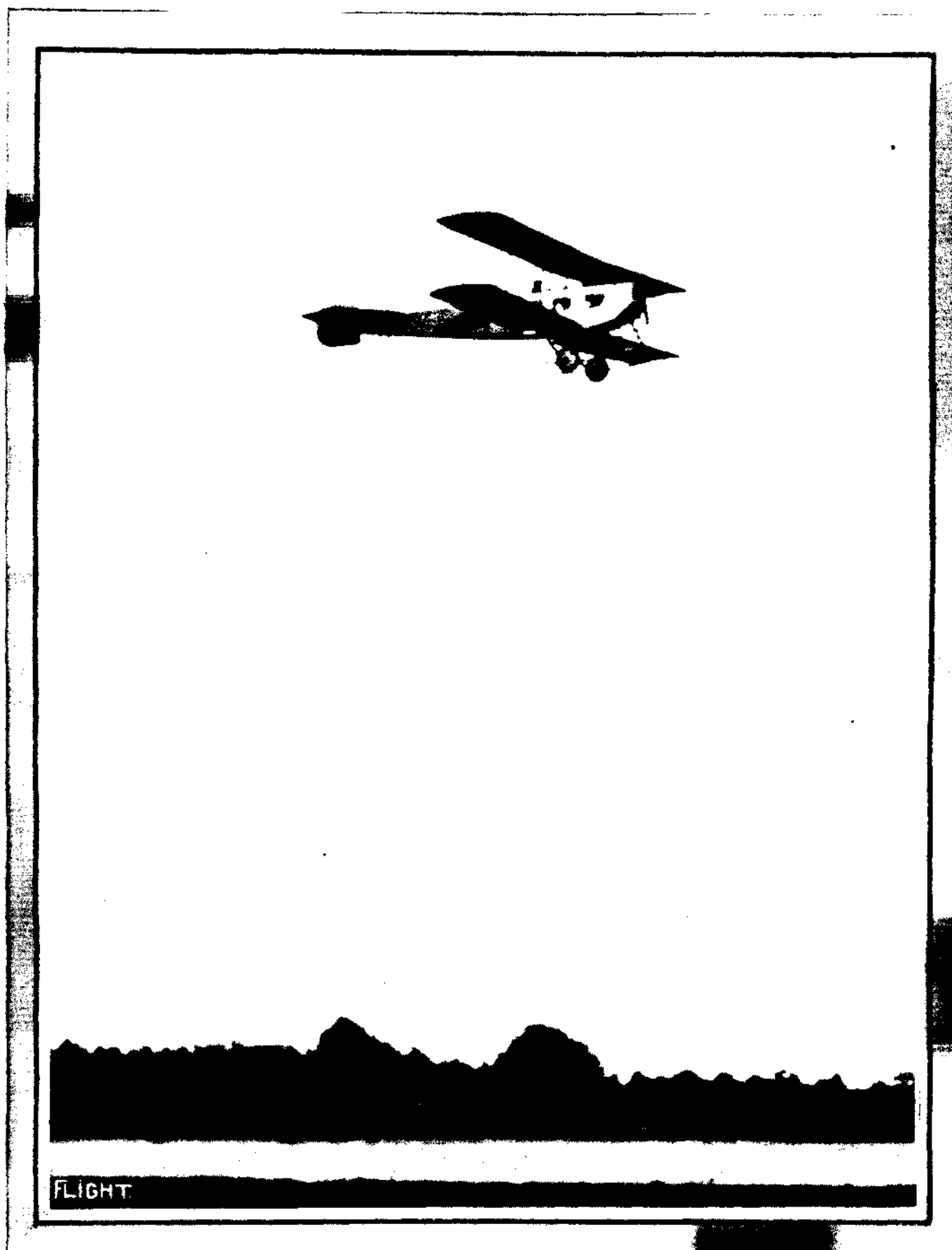


An impression of the illuminated night flying and Willows airship at Hendon Aerodrome.



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THE BRITISH HEIGHT RECORD.—Mr. Hawker on the Sopwith tractor at Brooklands.

passenger, started off for Eastchurch in the same machine. They only got as far as Park Royal, however, for the wind was so trying that they decided to return to Hendon, having been away for about 20 minutes. Other flights were made by Jules Nardini on his 50-h.p. Deperdussin monoplane, and by J. L. Hall and R. Slack on 50-h.p. Blériot monoplanes.

Sunday's flying more than made up for the previous day's slackness, for over 40 flights were made from 3.30 p.m. to 7 p.m. The wind had dropped considerably, and it was much warmer; there was, in consequence, a good attendance, and quite a number of cars were to be seen in the paddock. The following is a log of the afternoon's flights:—R. Slack started off on the 50-h.p. Blériot monoplane early in the afternoon with the intention of flying to Eastbourne, but engine trouble brought him down at Kempton Park, so he went on to Brooklands, returning to Hendon shortly before 5 o'clock. 3.5, Louis Noel out on the G.-W.-Maurice Farman biplane; 3.15, Pierre Verrier with a passenger on the 70-h.p. Aircraft-Maurice Farman; 3.25, Claude Grahame-White with a passenger on the G.-W.-Maurice Farman; 3.30, M. Baumann on the 35-h.p. Anzani-Caudron biplane, flying high for 40 mins.; 3.40, Gustav Hamel off to Brooklands on the 50-h.p. Blériot monoplane; followed by E. Cheeseman, who gave an exhibition flight on the 35-h.p. Blériot; 4, Lewis Turner with a passenger on the 60-h.p. Anzani-Caudron biplane, followed by E. Whitehouse on the 50-h.p. Handley Page monoplane; 4.5, Noel with a passenger on the G.-W.-M. Farman for 5 mins.; 4.11, Turner with a passenger on the 60-h.p. Caudron for 8 mins.; 4.16, Noel with a passenger on the G.-W.-M. Farman for 8 mins.; 4.20, Whitehouse with a passenger on the Handley

Page mono. for 6 mins.; 4.25, Noel with a passenger on the G.-W.-M. Farman for 6 mins.; 4.26, Turner with a passenger on the 60-h.p. Caudron for 6 mins.; 4.29, J. L. Hall on his 50-h.p. Gnome-Blériot mono. for 6 mins.; 4.37, Whitehouse with a passenger on the Handley Page mono. for 7 mins.; 4.40, Marcus D. Manton on the 50-h.p. Grahame-White biplane for 5 mins.; 4.41, Turner with a passenger on the 60-h.p. Caudron for 4 mins.; 4.44, Verrier with a passenger on the Aircraft-M. Farman for 3 mins.; 4.48, Manton on the 50-h.p. G.-W. biplane for 4 mins.; 4.54, Verrier with a passenger on the Aircraft-M. Farman for 4 mins.; 4.54½, Turner with a passenger on the 60-h.p. Caudron; 4.55, Whitehouse with Mrs. Whitehouse as passenger on the Handley Page mono.; 4.59, Verrier with a passenger on the Aircraft-M. Farman for 4 mins.; 5.4, Cheeseman with a passenger on the G.-W. biplane for 10 mins.; 5.5, Verrier with a passenger on the Aircraft-M. Farman for 4 mins.; 5.6, Turner with a passenger on the 60-h.p. Caudron for 3 mins.; 5.10, Verrier with a passenger on the Aircraft-M. Farman for 4 mins.; 5.21, do.; 5.22, Turner with a passenger on the 60-h.p. Caudron for 3 mins.; 5.24, M. Baumann on the 35-h.p. Caudron for 16 mins.; 5.31, Verrier with a passenger on the Aircraft-M. Farman for 4 mins.; 5.33, Turner with a passenger on the 60-h.p. Caudron for 5 mins.; 5.45, Manton on the 50-h.p. G.-W. biplane, stunting for 10 mins.; 5.55, Verrier with a passenger on the Aircraft-M. Farman for 11 mins.; 6.9, Manton with a passenger on the 50-h.p. G.-W. biplane; 6.17, Noel with a passenger on the 50-h.p. G.-W. biplane, after which Cheeseman took over the same machine, Grahame-White taking up a passenger shortly after. A few more flights were made on this machine by the above pilots before closing a busy day.



## THE DE BOLOTOFF TRIPLANE.

It is more than four years since Serge de Bolotoff's name appeared prominently in the aeronautical Press, but readers of the *AUTO*, prior to the foundation of *FLIGHT* may remember how a young Russian nobleman had a large triplane built for him at Voisin's, and entered therewith for the cross-Channel prize.

Serge de Bolotoff has for some time past been in possession of a shed at Brooklands, where he is at work on a machine under the ægis of a syndicate, "De Bolotoff and Co.," of which the chairman is Lord Marcus Beresford, and which numbers other influential English gentlemen upon its board.

Still enamoured of the triplane, M. de Bolotoff is not less enthusiastic for large size. His machine, which may be expected to emerge into the light any day now, is of

immense proportions. Standing in the passenger's cockpit, one feels as if on the bridge of a boat.

The machine is of the tractor type, the air-screws being driven by a Panhard engine of about 100-h.p. The body forms a longitudinal girder to carry the tail, and is of great size. The wing structure is peculiar, for while there is virtually only one spar, a steel tube, the main ribs are rigidly attached thereto by brackets, and not flexibly connected as in the case of the Breguet.

Travel of the centre of pressure naturally causes a couple about the spar, which is itself rigidly attached to large flat struts between the planes. A very small steel tube occupies the position ordinarily occupied by a rear spar, but it can hardly be regarded in this capacity on the de Bolotoff machine. In the light of present knowledge as to the distribution of pressure on wing sections, it is apparent that equally as much stress may come on the rear spar in flight as on the front spar. When there is no rear spar, the ribs and their attachments must be capable of safely transmitting the stress in the form of torsion on the front spar, which itself must be adequately constructed and arranged to withstand it.

In view of the very great interest that attaches to the problem of the large machine, it will be recognised that the de Bolotoff triplane is an experiment in a particularly important field of research.



### Burton-on-Trent to have a Flying Week.

ARRANGEMENTS are being made at Burton-on-Trent for a flying week commencing on August Bank Holiday. It will be remembered that a meeting was held at Burton in September 1910, when the participants were Mamet (Blériot), P. de Lesseps (Blériot), Ladougue (Goupy), Beaud and Mdlle. Dutrieu (H. Farman).

### The Paris to the Sea Trip.

DETAILS are now available regarding the event which the Aero Club of France proposes to hold on August 24th from Paris to Deauville. The contest will be open to two-seated machines, and if the second seat is not occupied 70 kilograms of ballast must be carried. It has not yet been definitely decided whether the start shall be from Maisons-Laffitte or St. Germain, but the finish will be at Deauville. The prizes are: 1, £800; 2, £400; 3, £240; 4, £160. The first entrant is Maurice Farman, with a biplane.



Lord Marcus Beresford.

## 70-H.P. SHORT BIPLANE.

MESSRS. SHORT BROS. execute so much confidential work for the Admiralty that the details of their construction are apt to escape the appreciation of the wider public that they certainly well deserve. Long ago, however, the firm established a reputation for sound aeroplane building, and the enviable good fame has

McClellan for the courtesy in placing this machine of his at our disposal for the purpose of their preparation.

Although this particular aeroplane is not a new model, it has the greater advantage of being well tried and a thorough success. Not only was it a good waterplane, but its owner was so favourably impressed with its



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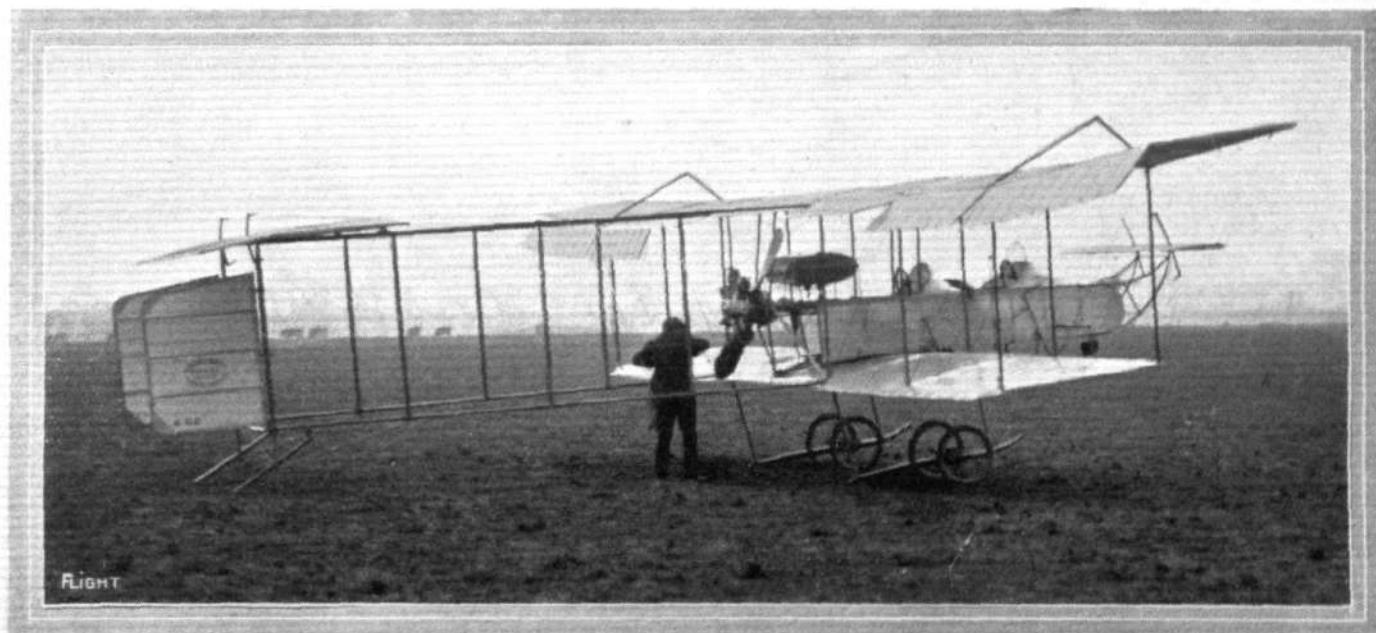
Three-quarter front view of a 50-h.p. Short biplane.—On March 22nd last Mr. Gordon Bell, accompanied by his mechanic, flew this machine from Eastchurch to Hendon in a very high wind.

remained, while the Short designs have met with an ever-increasing measure of success. To-day, the position of Short Bros. in the hydro-aeroplane industry is unique, and their factory is marked by extension upon extension.

It is a Short biplane, built originally for Mr. Frank McClellan for use over water, that forms the subject of our scale drawings and sketches this week, and equally with ourselves our readers are indebted to Mr. F. K.

qualities as a land machine after he had substituted a set of wheels for the floats, that he has since retained it for this purpose, in order to obtain greater enjoyment from its more frequent use over the Royal Aero Club's grounds at Eastchurch, where he has his sheds.

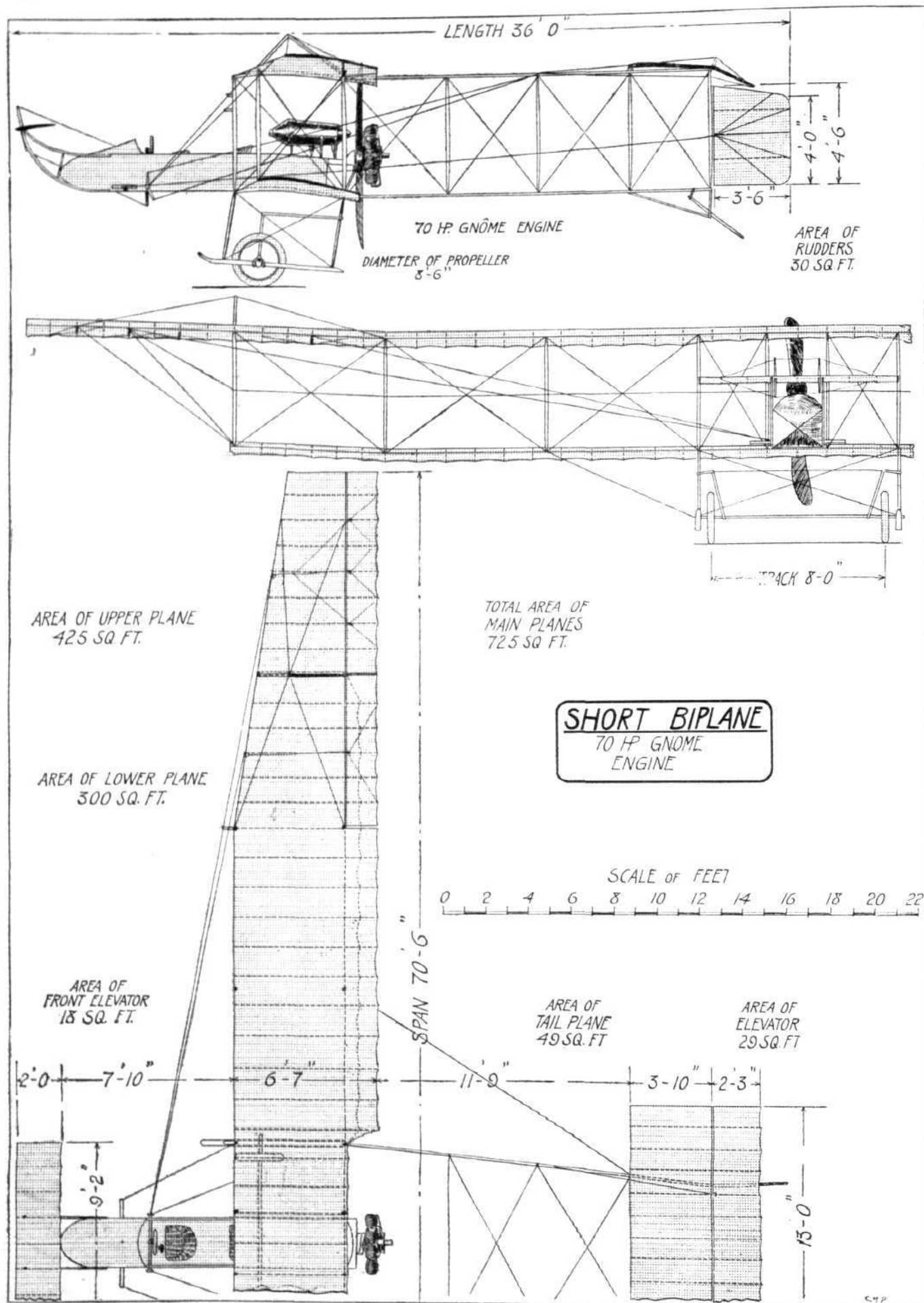
As a type the "pusher," as this machine is familiarly called in order to distinguish it from a tractor biplane of the same make that Mr. McClellan also owns, is



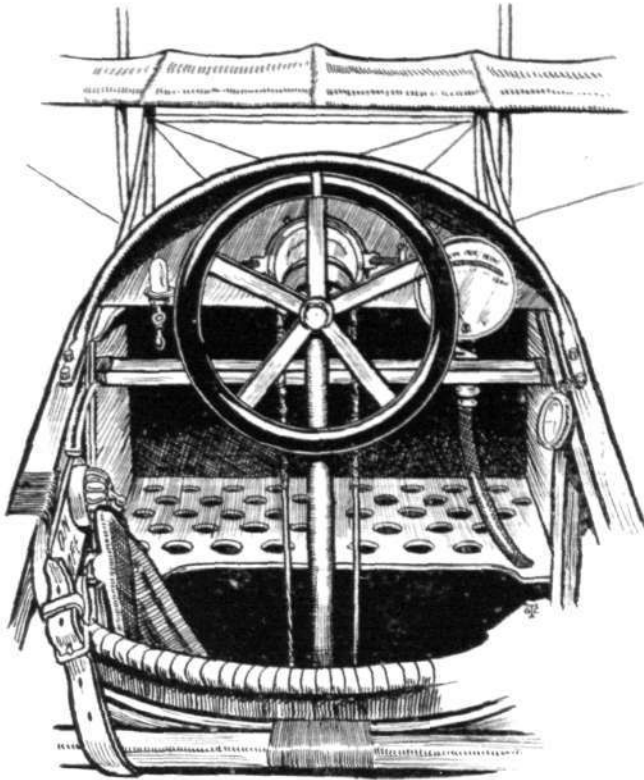
Three-quarter rear view of a 50-h.p. Short biplane.

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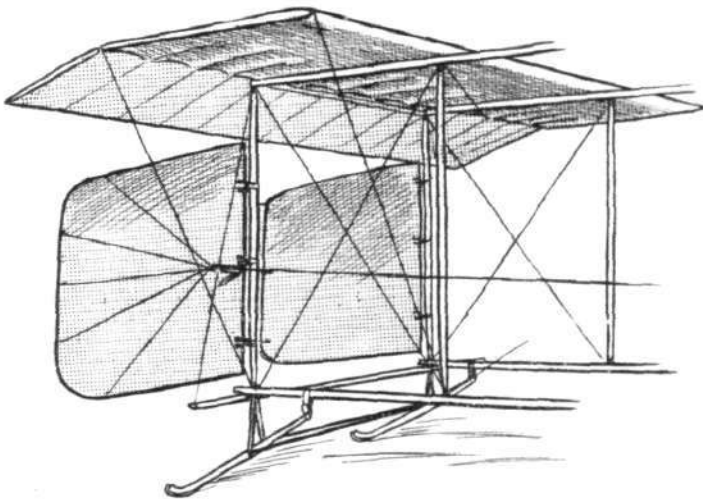
THE 70-H.P. SHORT BIPLANE.—Plan, side and front elevations to scale.



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Sketch of the controls on the Short biplane.

remarkable for its light loading. It has a wing surface of 750 sq. ft. for the support of 1,250 lbs. plus pilot, passenger and fuel. Allowing 350 lbs. for the people on board and for the petrol, it is evident that the loading is only just over 2 lbs. per sq. ft., a fact which explains the remarkably good gliding-angle of the machine.

An examination of the accompanying scale drawing



Sketch showing the detail of the tail of the Short biplane, and, on the right, the forward part of the nacelle with front elevator.

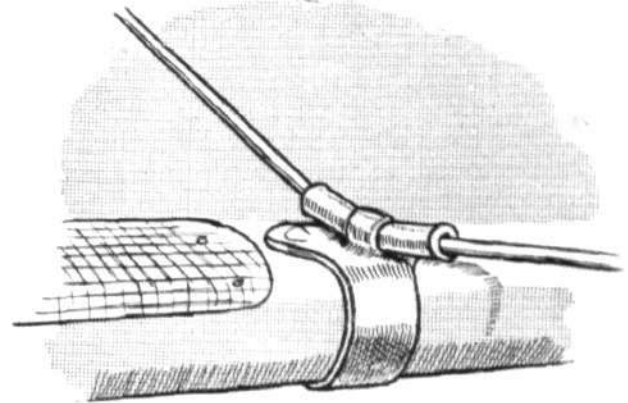
will show the machine to be of the engine-behind type, with a front elevator. This elevator, however, is of such small size that it might quite conceivably be done away with without in any way impairing the stability of the machine; but it is of use, in so far as it enables the pilot to judge the angle of the rear elevator.

In plan, the main planes are somewhat unusual, as, for a distance of about 16 ft. from the tip, the leading edges slope backwards. This portion of the wing is also

given a slight dihedral angle in order to impart a certain amount of natural lateral stability to the machine.

From the front view of the machine it will be seen that the span of the lower plane is considerably shorter than that of the upper plane, and the chord is some 10 ins. narrower. Lateral balance is maintained by means of *ailerons* of large area—about 28 square feet each—hinged to the rear spar of the top plane.

These *ailerons* are operated in the usual way through stranded cables running to a drum on the axle of the control wheel in front of the pilot. Another cable

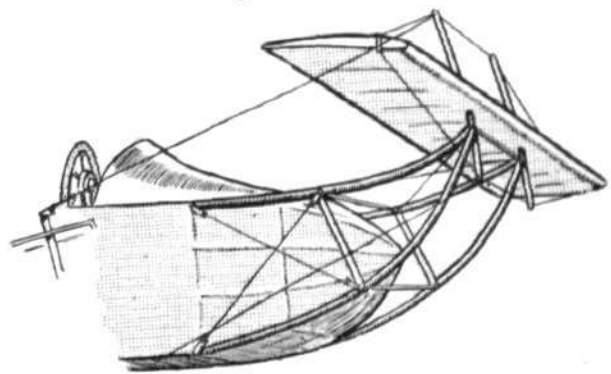


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Method of changing direction of control wires on the Short biplane.

running along the leading edge of the plane interconnects the two *ailerons*—Farman fashion.

Four wooden outriggers carry the tail planes, which consist of a fixed-plane of rectangular form, attached to the two upper outriggers, and which has hinged to its trailing edge the rear elevator plane. Underneath the elevator and hinged to the two rear struts connecting the tail-booms are the twin rudders by means of which the machine is steered in a horizontal direction.

Two tail skids carried on extensions of the rear outrigger struts and sprung from the lower tail-booms by means of rubber shock absorbers protect the tail planes against contact with the ground.



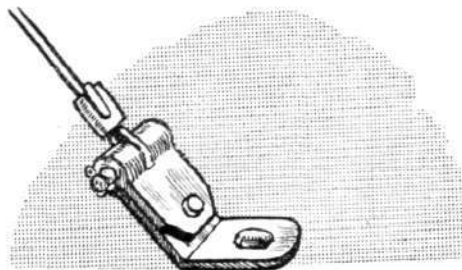
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For use on land, the machine is fitted with a chassis of the wheel and skid type. Four struts secured at their upper ends in sockets on the lower main plane carry at their lower extremities two stout wooden skids. A single tubular axle carrying the wheels is sprung from the skids by means of rubber bands. It will be noticed that the arrangement differs from the usual practice in having the wheels *inside* the skids. Strong diagonal bracing gives rigidity to the whole structure.

Projecting well out in front of the main planes is the *nacelle*, which carries on its nose the front elevator, and inside which are the pilot's and passenger's seats. From the front seat the pilot controls the machine by means of a hand-wheel mounted on the upper end of a tubular steel column, which in turn is secured to a transverse rocking-shaft. To the ends of this shaft, and outside the *nacelle*, are brazed two short levers, from which cables pass to the elevators.

A to-and-fro motion operates the elevators, while the *ailerons* are worked by rotation of the hand-wheel. As the machine is comparatively short for its span, it has been found desirable to have the rudders turn through a great angle for a small movement of the foot bar operating them.

This has been effected by making the levers on the rudders short, and having the foot bar itself long, so that the action is geared up. In front of the pilot are the instruments, altimeter, revolution indicator, compass, clock, map case, &c. Behind the pilot, and right over



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A wire attachment on the Short biplane.

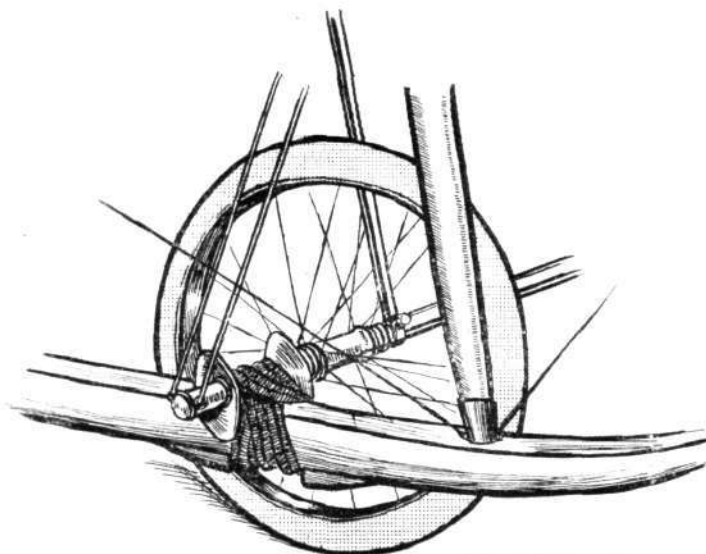
and the engine is a propeller of 8 ft. 6 in. diameter.

Petrol and oil is carried in a tank of streamline form, supported on tubular steel stanchions, which are attached

passenger have an exceptionally fine view of the country underneath.

At the rear end of the *nacelle*, and mounted on channel steel bearers, is the 70-h.p. Gnome engine, which furnishes the power. Be-

tween the rear engine bearer



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One of the tail skids of the Short biplane, and, on the right, detail of the left side of the landing chassis.

the leading edge of the lower plane is the passenger's seat. Owing to the positions of the seats both pilot and

to the upper *longerons* of the *nacelle*. The flying speed of the machine is 48 m.p.h.

## QUESTIONS IN PARLIAMENT.

ON the 29th ult., in the House of Commons, Mr. Sandys asked the Secretary for War the number of airships and aeroplanes respectively at present in the possession of the War Department; how many of the aeroplanes were biplanes and how many monoplanes; how many of the monoplanes were being used for practice or instructional purposes, and how many were being reserved for use solely in time of war; how many of the biplanes were being regularly used for instructional or practice purposes; the districts in which detachments of the Royal Flying Corps were at present stationed; and how many biplanes and monoplanes were available for use at each of the stations.

Col. Seely: The Royal Flying Corps is stationed at South Farnborough, Salisbury Plain, and Montrose. It is not considered to be in the interests of the public service to publish the other information which the hon. member asks for.

Further questions by Mr. Sandys drew from Col. Seely the information that there were 63 officers on the active list in possession of flying certificates granted at the Central Flying School, and 20 officers who had qualified before the school started. There were 17 of other ranks in possession of certificates. The first officer to graduate at the school after it was opened on August 17th, 1912, obtained his certificate on August 24th. The tests had not been altered since last August. The strength of the Royal Flying Corps Military Wing on May 1st amounted to 70 officers and 583 other ranks, and at the Central Flying School there were six military officers and 68 other ranks belonging to the Royal Flying Corps.

There were no civil mechanics employed with the military wing or at the Central Flying School.

ON Tuesday last, Mr. Sandys asked the Secretary for War whether in view of the official refusal to give any information whatever with reference to the numbers of aircraft in the possession of the War Department, it is now the policy of the Government to withhold all such information from the House of Commons; and, if so, on what grounds this decision had been arrived at.

Col. Seely: It is not the custom to publish detailed statistics of the personnel or strength of the British Army. I hope to make a general statement on Thursday.

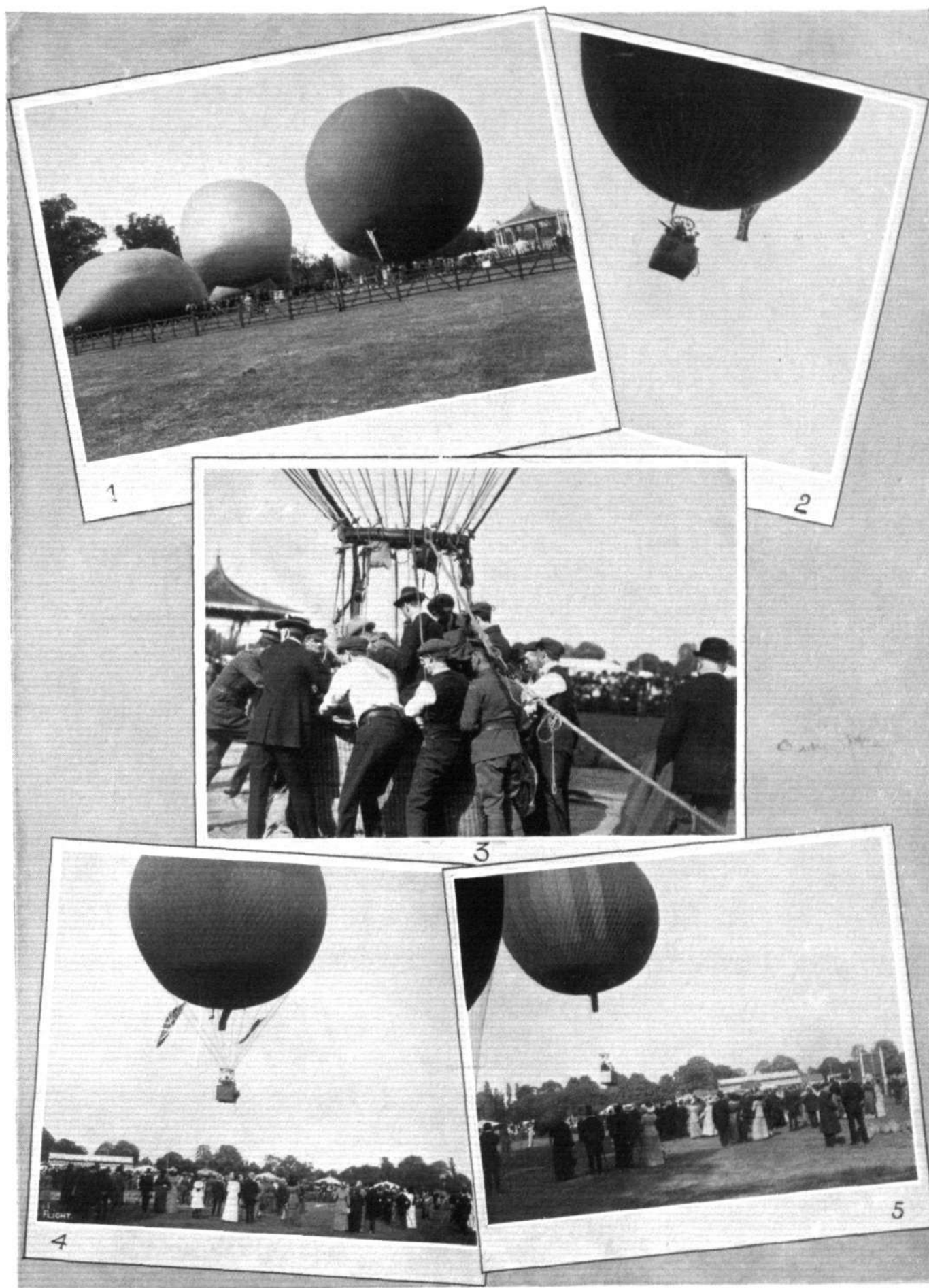
Mr. Sandys: In view of the fact that it is the policy of the Government to withhold information as to the number of aircraft in the possession of the War Department are we to understand that the figures which the hon. gentleman gave on March 19 are not correct?

Col. Seely: It is not the policy of the Government to withhold from the House any information which can properly be given, and I may say we have given much more complete information than has been given to the Assemblies in any foreign countries.

Mr. Lawson: Will the right hon. gentleman before he makes his statement issue a return giving the aircraft in their different classes?

Col. Seely: Yes. I am glad the question has been asked, because I propose to issue a paper giving the fullest information possible and such information as we have in other directions in regard to aeronautics.





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ROYAL AERO CLUB "HARE AND HOUNDS" BALLOON RACE AT RANELAGH.—1. The six competing balloons being inflated. 2. Mr. John D. Dunville's "The Banshee." 3. "The Banshee" (the hare) just about to rise with her pilot and four passengers—Mr. John D. Dunville, pilot; Mr. C. F. Pollock, Capt. B. Corbet, Mr. P. Gardner, Mr. R. Dunville. 4. "Dunlop," Mr. James Radley (in soft hat) as pilot, and Sir Claude Champion de Crespigny, Bart. 5. "Zeta," Capt. Hon. Claude Brabazon (pilot) and Mr. R. R. Smith Barry.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 3rd inst., when there were present: Col. H. C. L. Holden, C.B., F.R.S. (in the Chair), Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Mr. John Dunville, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, Mr. R. W. Wallace, K.C., and the Secretary.

**Congratulations to Mr. Mervyn O'Gorman.**—Mr. Mervyn O'Gorman was congratulated by the Committee on being made a C.B.

**New Members.**—The following new members were elected: Col. Edward John de Sallis, Eric L. Dower, Dr. Beaumont Harry Comerford, Lieut. H. L. Reilly, I.A., Harold Shephard, and Lieut. W. C. Loder Symonds.

**Aviators' Certificates.**—The following Aviators' Certificates were granted:—

No.	Date.	
493	May 26, 1913	Pierre Gandillon (Blériot Monoplane, Blériot School, Hendon). Subject to permission of the Aero Club of Switzerland.
494	May 27, 1913	Lieut. William Charles Hicks, R.N. (Caudron Biplane, Ewen School, Hendon).
495	May 29, 1913	Lieut. Gordon Adams (South Lancashire Regt.) (Short Biplane, Central Flying School, Upavon).
496	May 29, 1913	2nd Lieut. A. A. Allen Knight (Royal Munster Fusiliers) (Vickers Biplane, Vickers School, Brooklands).
497	May 29, 1913	Capt. Francis Stuart Wilson, R.M. (Bristol Biplane, Bristol School, Brooklands).
498	June 2, 1913	Lieut. Ambrose Gratton Power (Royal Munster Fusiliers) (Grahame-White Biplane, Grahame-White School, Hendon).
499	June 2, 1913	Lieut. Malcolm Wallace Duncan, R.A. (Bristol Biplane, Bristol School, Brooklands).

**Aerial Navigation Regulations.**—The Committee had under consideration the refusal of the Home Office to grant exemptions under the Aerial Navigation Regulations to competitors taking part in the *Daily Mail* £5,000 Prize, the Aerial Derby and the Hurling-

ham Balloon Contests. It was decided to request the Chairman, the Marquess of Tullibardine, M.V.O., D.S.O., M.P., to approach the Home Secretary with a view to receiving a deputation from the Club on the subject.

**F.A.I. Conferences.**—Mr. Roger W. Wallace, K.C., and Mr. Griffith Brewer were appointed delegates to represent the Club at the Conferences of the Fédération Aéronautique Internationale to be held at Brussels on June 19th, 20th, and 21st, 1913.

**British Height Record.**—The report of the flight made by Mr. H. G. Hawker at Brooklands on May 31st, 1913, together with barograph charts, were considered, and it was decided to accept the height accomplished—viz., 11,450 feet—as a British height record. The aircraft used on the occasion was a Sopwith tractor biplane, fitted with an 80-h.p. Gnome.

## Balloon Race at Hurlingham.

The Balloon Race at Hurlingham on Saturday last for the cup presented by Mr. John D. Dunville resulted in a win for Mr. James Radley, who succeeded in effecting a landing within 200 yards of the "Hare" Balloon, which descended at Sudbury on the borders of Suffolk. The start was witnessed by a large number of Members, who availed themselves of the privilege of free admission granted by the Hurlingham Club to the Royal Aero Club Members on Balloon Contest days.

The next Balloon Contest will take place on June 28th and July 12th, 1913.

## Mortimer-Singer £500 Prize.

Mr. T. O. M. Sopwith is now ready to make the flight for this prize, and attempts will be made almost immediately. The course is on the Solent, and the official observers on behalf of the Club are Lieut. Spencer D. Grey, R.N., and Mr. J. H. Spottiswoode. The aircraft is a Sopwith tractor biplane fitted with 100-h.p. Gnome engine. The pilot is Mr. H. G. Hawker.

In this Competition, six out and home flights have to be made on a course from a point on the land to a point out at sea, not less than five miles distant in a direct line, but the latter point shall not be less than one mile from any shore. Alightings have to be made on arrival at each point.

166, Piccadilly, W.

HAROLD E. PERRIN, Secretary.

## "The Unofficial Honeymoon."

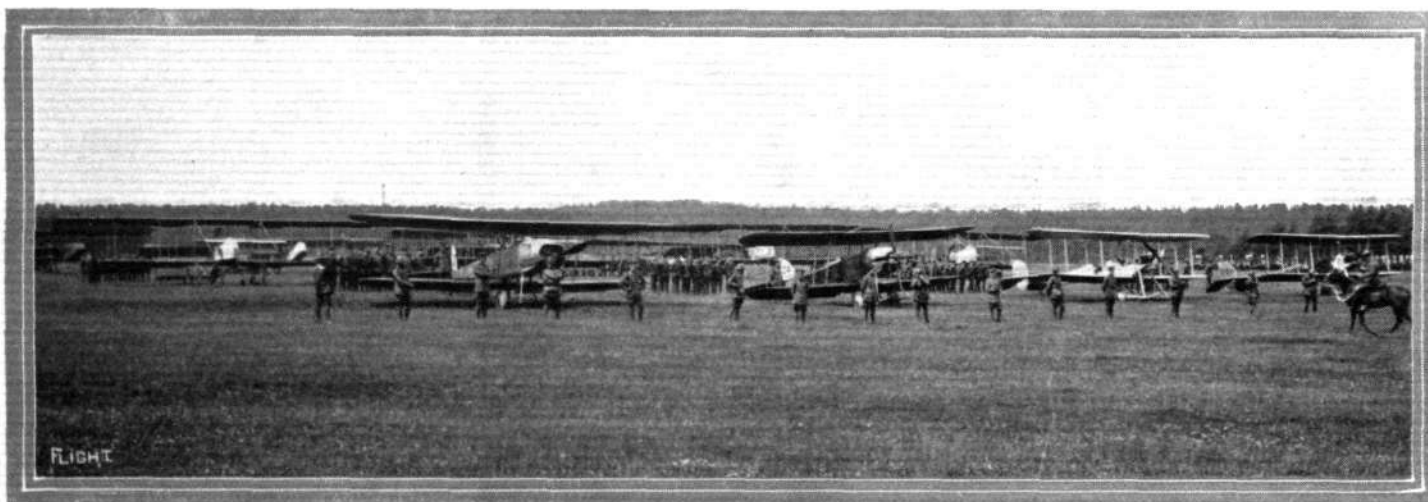
HAVING purchased a shilling copy of "The Unofficial Honeymoon," by Dolf Willard, we feel we have a right to criticise this book, even as he who pays a similar sum elsewhere gives voice to his approval from the gods.

The story is charming, but to the aeronautical mind two passages are not quite clear. If therefore the word "net" on the outside of the cover is not to be read too literally, perhaps the author may add an explanation to what undoubtedly is a good shilling's worth.

On page 197 the reader is told that they lived a simple life on the island in a rarefied atmosphere. Seeing that the density of the atmosphere is greatest at sea level, how did they near the sea shore live in a rarefied mountain air?

On page 99 one's sympathy goes out to the poor lone hen which got ashore from the wreck but could not raise her brood when she had hatched them. Was this hen a triumphant suffragette raising chicks by herself unassisted by the sterner sex?

Both of these questions when explained should be of the greatest interest to aviation.



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AIRCRAFT ON LAFFAN'S PLAIN FOR THE "FLY PAST" ON THE KING'S BIRTHDAY THIS WEEK.—  
In the parade there were four BE type, six Maurice Farmans, and two Henry Farmans.



# A DAY'S CROSS-COUNTRY WITH GORDON-BELL.

By CHARLES C. TURNER.

GORDON-BELL was going to Buc to take delivery of a new 80-h.p. Gnome Borel 2-seater, and it was suggested that I should accompany him. He had not before flown on a Borel. Accordingly, we went to Buc on the evening of Tuesday, May 27th, to try it. He took me up for a trial flight after two solos on it, and two others on a single-seater. While we were flying, the neighbouring aerodromes of Blériot and Farman were astir, dozens of machines being out, among them one disporting itself in the hands of Chevilliard, up to his old tricks again.

The characteristics of the Borel are well known, and need not be described here. It is a machine with small overall length relatively to the span, and with a "floating" elevator. The speed is reckoned to be 72 miles per hour, with a full load. Our flight showed that she can carry, besides two persons weighing together 22½ stones, all the necessary instruments, and sufficient fuel and oil for over 4 hours' flight—probably enough for 4½ hours. It is a type that the firm are making in large numbers for the French War Office. And they are equally busy turning out single-seaters, one of which we saw taken over by the French military authorities, and hydro-aeroplanes.

When we got back to Buc at 4 a.m. on Wednesday morning, it was obvious from the wind that we should make a slow journey, so we decided to make first for Le Crotoy, where the Caudron hydro-aeroplane is situated, and there replenish if necessary.

We kept a pretty even altitude of 600 and 700 metres throughout the land journey, but went much higher for crossing the Channel. The engine was doing rather less than 1,200 revolutions all the time. The machine flew with singular steadiness, in *remous* lifting and falling on an even keel and not pitching and tossing to any appreciable extent, after the manner of longer tailed buses. She lands beautifully, and her tail skids pull her up well. Of course the 80 Gnome is an absolute dentist, and she pulls out of some very thick and rough country at times. The passenger sits in front, and has comfortable quarters, with a very good view, being well forward. There is a small wind screen.

We started at 4.30 and headed for Versailles. When over Versailles the great wooded slopes, the winding Seine, the blur of mist that hid Paris, of which city the only visible feature was the Eiffel Tower, and the sun rising in a mist made an unforgettable picture. Mont Valerian, our first landmark, looked like a black limpet among tangled weeds. As the sun lifted it lightened the landscape, and as the country opened out this consisted of an infinity of green and light-brown angular but irregular patches with frequent woods. After flying for half an hour we found we were only progressing at the rate of about 42 miles per hour. Gordon-Bell had a roller map, and I had provided myself with some ordnance maps which I cut into strips for the route, so that we could both observe the course. By turning my head I could see the compass also. As we approached Meru, Gordon-Bell borrowed my note-book and wrote in quite his best hand the following question: "This is Meru. How far have we come, and in how many minutes?" I measured it up and replied "60 kilos. in 58 minutes." An old biplane of the 40-mile per hour order would have scarcely got away from Buc at all. But the wind, though strong, was steady. As a rule when Gordon-Bell wanted to speak to me he cut off for a few seconds, and while we planed down a few yards we discussed the situation.

At 5.43 the wind screen was suddenly blurred with a stream of petrol, which also blew sharply into my face and began to pour down my arms and hands. The vent on the tank cap was leaking, and to stem the flow I put out my hand and kept a finger on the hole, lifting it for a moment or two at frequent intervals to let the air in. This lasted for 5 minutes; and then a new trouble arose. The course ahead became obscured in a dark mist, and nearer at hand came a legion of small scurrying clouds below us. As we got over them more and larger ones succeeded, and soon we were in the thick of it. We flew lower, only to find the land fog-bound; and so we decided to stop. Gordon-Bell brought the machine down into a large field, only seeing and clearing just in time a black iron fence dividing the field into two parts.

Some cattle promptly trotted up and surrounded us. They were young bulls, and their curiosity knew no bounds. They attempted to eat the planes, and tried various other experiments. The bovine boy's equivalent for the human boy's everlasting "Why, mamma?" is apt to be annoying. Gordon-Bell and I had to keep a bold front; the slightest sign of yielding brought them on boldly with lowered horns. Some labourers came up and helped us. I would have given anything for a camera when we started from that field 20 mins. later. The moment the machine moved the bulls broke loose and galloped after us, heads down. We turned to the left at the bottom of the field, and they turned also and tried to

head us off. Had the engine stopped then the Borel would have become so much cud; but she got up and away.

No sooner were we up than something struck me on the head, apparently thrown back from the propeller. Gordon-Bell drew my attention to the top of the tank. One of the taps had disappeared. I replaced it with one from the tank inside the cockpit.

After fifty minutes' flying we were forced to descend again by thick fog. This time we were at Thieulloy l'Abbaye, where we were held up for over an hour. And we had no sooner got away than we began to feel doubt about the route. At times the country seemed recognisable from the map, and, as usual under these circumstances, the slightest resemblance was made the most of. The compass pointed about right. But after a time illusions failed us, and we knew we were astray. I felt certain at one time that a big wood we were skirting was the forest of Crecy, so exactly did its shape resemble that shown on my map. We forged steadily ahead for two hours, the country very slowly rolling back below us. Soon after 9 o'clock the horizon ahead had become a sharp white line, and we concluded we were approaching the sea. At 9.45 we were in no doubt whatever, and soon after we caught a glimpse of the water in a rift in the fog.

I would like to say a word here about Gordon-Bell's fine piloting when looking for a resting-place. He swooped about like a hawk after its prey until he found there was nothing better than a big clover field near the edge of the cliffs, over which the mist was streaming inland. There was no other place for miles, and on it he brought the machine cleverly to rest.

We had circled over a little coast town twice during our search, and from that place now came hundreds of people, who told us, to our amazement, that we were at St. Valerie-en-Caux. We waited four hours in the clover field among a great crowd of untidy peasants. The police came up and wanted to see our certificates. Gordon-Bell had left his at home. However, it was easy to give the required information; apparently, the chief concern was as to whether we had come from England with dutiable goods.

Leaving St. Valerie at 2.30, the machine got off the thick clover and uneven ground in fine style, and as we soared aloft the sea down on our left was hidden by low-lying clouds, while the land below and to the east was brightly lit by the sun. It was a magnificent experience—this of flying along the coast of France. We passed Dieppe at 2.45, and in the far distance could see the mouth of the Somme, where our first halt was to be. Le Crotoy adjoins another St. Valerie, a little village which gradually came into view. To the left of it I could distinguish some sheds, and pointed them out to Gordon-Bell. While we crossed the estuary we were descending rapidly, and could see men on the sands waving to us and pointing out the landing-place. Landing on smooth sand is delightful. There was plenty of space, too, so that the long run was of no account, but it was judged so nicely that we came to a stop a few yards from our friends.

We replenished the tanks, chatted with the Caudron pilots, and saw a new 80 Gnome Caudron. Then, at 4.40, having received instructions as to where to look for the landing place at Calais should it be advisable to descend there, we resumed our coast journey. Etaples was soon reached, and Boulogne came into clear view, but far below, for we were then steadily climbing. We left Grizez about five miles to the east and, nearing Sangatte, attained a height of 1,800 metres. Then as we turned north westwards and approached the coast a faint line across the Channel slowly emerged from uncertainty and appeared as the English coast. Here, too, the Channel was clearer. We could see the waves looking like minute ripples, but apparently without movement.

From Boulogne to Sangatte the cap vent was leaking badly—indeed, both of them. I was drenched with petrol, and breathed it for 20 mins. Perhaps it is good for one. Is it a germicide, I reflected? And then came the afterthought—perhaps I'm the germ! For 20 mins. I kept my finger on the vent with brief intervals, and got very cold. Then it stopped.

England being in view, and the motor going strong, Gordon-Bell kept ahead, steering an almost due westerly compass course, although we wanted to cross a few miles east of Dover. We left the French side at 5.20, and for a long time seemed to make no progress. Under the declining sun the sea in the far distance, somewhere about Hastings or Brighton, gleamed white. Below, it was a light grey, and here and there a ship could be seen—a 4-master in tow, two large steamships looking no longer than one of these letters, and specks of fishing boats. Very slowly we left the French coast behind, and Dover began to stand out marked by the thin lines of its pier and breakwater. At 5.37 we appeared to be about half-way across, and the view was one of the most magnificent I have ever seen.



It was the first time I had crossed by any aircraft from the Continent to England, and I naturally recalled my two long cross-sea balloon trips the other way with Mr. Gaudron some years ago, one of them over 360 miles of North Sea, when, from a height of 12,000 ft., we could see the whole of Jutland. But ballooning gives nothing like the sense of power that comes from being in a craft of which you can direct the course. We could see the whole of Kent; the coast line from Hastings, past Dover and Deal, Ramsgate and the Nore, and the Thames estuary, past the mouth of the Medway, and probably as far west as Tilbury, was in view. The land appeared as the softest of grey smudges, on the far side the estuary gleaming yellow-silver under the sun, while the Channel to the west was white under the clouds. Behind us lay France.

We were obviously drifting considerably to the east, for as we neared England the South Foreland was well to the left, and we continued over the Downs, with Deal five miles or so to the west. A little farther on Gordon-Bell dipped the head of the machine down and we descended rapidly, switching on and off. This was one of the finest things I have ever seen, for our angle made the machine point directly upon Pegwell Bay, with its tiny white cliffs still lying some miles ahead and three-quarters of a mile below, but, as we descended, rapidly coming up towards us and revealing, second by second, more and more detail.

We crossed the coast at 6.2, having taken 45 mins. to cover about 32 miles of sea. It was pleasant to be over land again, for unquestionably the Channel crossing has certain terrors. We were safe enough, because the land was ever in view, as also were ships. But even as we got to the English coast the clouds came rolling up Channel, threatening to blot the view out. Even when you can see clearly, and can watch a distant coast, it takes a long time to estimate the exact amount of drift, and it is, therefore, quite possible to steer a very curved course, losing time which may be life itself.

The end came soon after we got to England. For half an hour we had a delightful journey, with the Thames estuary on the right and the smiling land of Kent below. The wind, however, was rather troublesome, and the machine rocked at times. Suddenly, when just south of Whitstable and on the point of turning to cross to Sheppey, the engine stopped dead. The next instant I found her head sharply down and the land hurrying up to us. At first I expected Gordon-Bell would switch on, but as the engine continued silent it was evident that for some reason a landing not in our programme had become necessary. We were heading towards some tall trees, and I thought Gordon-Bell would bring her up a bit and glide over their tops. Then I saw that the field below was crowded with sheep.

It began to look like trouble, and even now I cannot quite understand how we steered between the trees. But when I tell you that the rush of air for a few minutes was stung on the side of my head instead of in my face you will understand that a "stunt" was in progress. We came down through those trees, swaying from right to left and almost touching them, and then straightened out to land. The sheep had now cleared away save one ewe and her lamb, and over this family group the machine lifted, then landed gently as a feather, and ran forwards, stopping with 40 yards to spare. It was a good bit of work, for the landing was a forced one, the field we had got to the best within range, and Gordon-Bell had spotted it on the instant, his skill enabling him to get there. A novice would have landed somewhere from whence he would have been at a loss to get away.

The magneto had given out, but we could not get help that night, for, on trying to get on the 'phone to Eastchurch, we found the wires had been broken down in the storm of the previous day. The owner of the land on which we had stopped here came to our assistance. He invited us in to supper, and as it was the first sound meal we had had that day it was welcome. Also, he made Gordon-Bell stay the night. As for me, it was necessary that I should get back to town, and after supper I caught a train from Whitstable.

The flight ranks as quite a good performance even in these days of long aerial "raids." The last 100 miles non-stop, which included the Channel and a hot-stuff landing, was top-hole. This was Gordon-Bell's first Channel crossing, which makes the whole thing all the better. To me the day was full of priceless experience, health, and enjoyment.

	Distance in miles.	Time. h. m.
Buc to Milly	54½	1 20
Milly to Theuilly l'Abbaye	24	0 50
Theuilly to St. Valerie	about 62½	2 2
St. Valerie to Le Crotoy	50	0 42
Le Crotoy to Whitstable	about 100	1 52
Total	291 miles	6 46

The following is our log, which, besides being a summary, gives more exact times of the happenings:—

Wednesday, May 28th, 1913.—4.30 a.m.—Started from Buc. Wind W.N.W. A big half circle for height, and away. Sun in a maze of light, but country to east under mist.

4.40.—400 metres.

4.45.—600 metres. Eiffel Tower to right. Paris in mist. Mont Valerian ahead.

4.55.—Over the Seine.

5.—Only 46 kilos. in 30 mins. More wind than we thought.

5.5.—700 metres. Almost over Pontoise. Low hills on right in shadow.

5.10.—Open cultivated country now, with few woods or villages.

5.16.—Wood of Hedouville. A big *remous* here. Judging from smoke below wind pretty strong. Can see Meru. Villeneuve on left. The sun is good now, and mist is going from the east. Gordon-Bell borrows my note-book and writes in it: "This is Meru. How far have we come and in how many minutes?" I write on the opposite page: "60 kilos. in 58 m."

5.30.—Noailles on right. Beauvais ahead. Overhead blue sky with grey bank of mist north, south and west horizons.

5.43.—Beauvais. 80 k. in 80 m. Petrol shooting out of vent in cap. I hold my finger on, with intervals to let air in.

5.50.—Flying into clouds. Obligated to land in field with cattle.

6.10.—Off again. Bulls chase us as we get along.

6.13.—Cap of tank flies off and hits me in head. Replace it with one from bottom tank.

6.23.—Milly.

6.30.—St. Omer. 600 metres. Then Marseille le Petit. Through the clouds again. Getting very thick. Come lower to see. Not much clearer, and plenty of bumps.

7.—Landed at Theuilly l'Abbaye. Lots of people and some more bulls.

8.13.—Off again. G.-B. says compass is wrong. Very uncertain about locality. Busy trying to find it.

9.15.—Ahead horizon sharp white line. G.-B. thinks it's the sea. Wood down on the right looks like Forêt de Crecy from map.

9.35.—Sea ahead. Fog over it and coming round us.

9.45.—Looking for place to land.

10.15.—Landed in clover field near edge of cliffs. St. Valerie *en caux*. 70 kiloms. from Crotoy!

2 30 p.m.—Left St. Valerie.

2 45.—Over Dieppe. Going right along coast. Beautiful sky and sunlit land. Sea under rolling cloud. Looking for Caudron aerodrome at Le Crotoy.

3.12.—Landed on sands at Crotoy.

4.40.—Left Le Crotoy. Following line of coast still. Climbing steadily. Grisnez and Calais in view. Boulogne on left. England visible. Sea to left covered with mist. Heading north-west. 1,800 metres up. Sea in Straits clear, but much cloud in far west.

5.20.—Left French coast. Two large ships in view. Sea clear, waves like tiny ripples. Seven vessels in sight, including fishing-boats. Sun shining through thin clouds.

5.37.—About half way. Grand view on all sides. Dover harbour visible. Most of Kent can be seen right up Thames to where river narrows. Far past Medway. South as far as Hastings at least. First time I have crossed from Continent to England. We do not seem to make much progress. Dover lies in a sea of light. Below is a four-master in tow. A big passenger boat behind us. Fog looks as if it were coming up Channel.

5.57.—Dover miles to west, also Walmer and Deal. We have drifted too far to east.

Coming down and heading direct at Pegwell Bay. Land still three or four miles away. On the level again about 900 metres.

6.—Another long descent.

6.2.—Crossing coast line at about 600 metres. Ramsgate on right. Plenty of *remous*. Wind strong against us.

6.15.—Reculvers on right.

6.20.—Level with Herne Bay now. Kent looks very beautiful. Greener than France. Sheppey getting more distinct now.

6.32. Whitstable. Crowd of oyster boats. Coming down.



## The Belgian Aerial Post.

CROMBEZ, the aerial postman at the Ghent Exhibition, carried the mail from Ghent to Ostend on his Deperdussin monoplane. He also brought a sack of mail from Ostend to Ghent.

## Germany's Exports and Imports.

DURING the first four months of this year nine aeroplanes valued at £7,000 were imported into Germany as against four valued at £5,800 for the corresponding period of 1912. The exports for the four months were thirteen machines valued at £12,400, whereas in the first four months of last year only one machine was sent out of the country.

## FROM THE BRITISH FLYING GROUNDS.

### Brooklands Aerodrome.

MONDAY, last week, Lieut. Broder, of the 5th Worcestershire Regiment, passed his *brevet* tests in good style on the Bristol biplane.

Lieut. R. B. Davies (carrying Lieut. Clarke Hall as a passenger) flew, on Wednesday, over from Eastchurch on the Sopwith tractor biplane, which was delivered to the Navy some time ago, and after a short stay resumed his journey to Bradfield, Berks.

Thursday, Lieut. Knight, of the 3rd Royal Munster Fusiliers, went through his *brevet* tests in excellent style on the Vickers biplane. Lieut. Duncan passed the first part of his *brevet* tests on the Bristol biplane. Capt. F. S. Wilson, of the Royal Marines, passed his *brevet* tests in excellent style on a Bristol biplane, after only a week's instruction.

Mr. Hawker made a first test of another Sopwith tractor biplane on Saturday, which started right away, and proved to be as quick a climber as its predecessor. Lieut. Spencer Grey afterwards made some good tests on the same machine. Advantage was taken of the fine exhibition flights of the new Martin-Handasyde (with Mr. Gordon Bell as pilot) monoplane by a representative of a cinematograph company, who was able to secure some excellent films. Mr. Gordon Bell made several flights with passengers, amongst whom were the four winners of the ballots for the free passenger flights. The event of the afternoon was Mr. H. Hawker's attempt on the British Altitude Record, on the new Sopwith tractor biplane fitted with an 80-h.p. Gnome engine. The wind having dropped and the sky cleared, the weather conditions were perfect, and the question on everyone's lips was not "Will he beat the record?" but "By how much will he beat it?" The machine used was the one which climbed the 7,500 ft. in 15 mins. recently at Hendon. The sky was absolutely cloudless, and the large concourse of spectators were thus enabled to keep the machine easily in sight all the time. The machine climbed steadily upwards for about 45 mins., at the end of which

time it had reached an altitude of 11,450 ft., beating the previous British best by 950 ft., and as the pilot was experiencing some little difficulty with the mixture, he decided to come down, and shutting his engine off he made a beautiful 9 minutes' glide to terra firma again. Mr. Hawker received a rousing welcome and innumerable congratulations on his fine achievement. This makes his third success on the machine, for he commenced well by winning the altitude contest at Hendon, when he quite outclassed all the machines there, and this he quickly followed up by winning the Whit-Monday Cross-Country Race from Brooklands in rain and strong winds. Mr. Sopwith is certainly to be congratulated on having such a first-class pilot as Mr. Hawker to demonstrate the wonderful capabilities of the new Sopwith tractor biplanes.

Lieut. Anderson and Lieut. Porter arrived on two B.E.-type machines (203 and 204).

On Sunday Mr. Merriam of the Bristol School was the first out before breakfast, and after taking up several pupils took one of them for a nice cross-country trip. In the afternoon Mr. Slack arrived from Hendon on his Blériot monoplane, with the intention of continuing his journey to Eastbourne, but as his engine was not pulling well he decided to return to Hendon, which he did after some small adjustments. Mr. Hamel started from Hendon on his single-seater Blériot monoplane, but had not gone far ere he found he was short of petrol, and accordingly returned to Hendon for a fill up. He started again at 3.55 p.m. and flew to Brooklands (21 miles) in 10 mins., his fastest journey so far, and gave a very fine exhibition flight, in the course of which Mr. Gordon Bell on the new Martin-Handasyde monoplane, carrying Mr. Barnwell of the Vickers School as a passenger, came up behind him, and a very pretty sight was witnessed as the two pilots played at "aerial leap-frog" side by side, literally chasing one another round the aerodrome, what time each pilot seemed to vie with the other in the many graceful evolutions performed, and many were the exclamations of wonder by the spectators on the marvellous control these



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The Sopwith tractor coming straight ahead at Brooklands with Mr. Hawker, who has just made a new height record, at the wheel.





**Mr. A. Allen Knight, a pupil at the Vickers Flying School, Brooklands, who took his pilot's *brevet* on the Vickers biplane last week in excellent style.**

pilots seemed to have over their respective machines. In the course of Mr. Hamel's second exhibition flight, something was seen to drop from the engine of his machine, and he thought it advisable to put the machine away until his mechanic had had an opportunity of thoroughly overhauling it before a further flight was made. Mr. Merriam, in the course of the afternoon, gave some very good exhibition flights on the Bristol biplane. The winner of the ballot for the free passenger flight was Mr. W. Beckingham, of 60, Field Road, Reading, and he was taken up for a nice trip by Mr. Hawker on the same machine, which the day previous had beaten the British altitude record. Mr. Hawker then made several trips, each time with two passengers, and the machine seemed to climb as quickly with and without passengers. On one occasion when Mr. Hawker had two passengers, Mr. Gordon Bell started after him on the latest Sopwith tractor biplane, and the two machines flew side by side, thus providing an excellent opportunity for comparison. Mr. Hawker has further intentions in the near future in regard to the British altitude records for one, two, and three passengers, with the Sopwith tractor biplane, and interesting results may be confidently anticipated. In Mr. Barnwell's absence from the Vickers school, two of his pupils who had previously passed their *brevet* tests in most brilliant fashion (Messrs. Waterfall and Mitchell) acted as instructors, and thus materially lightened the burden of Mr. Barnwell's assistant—Mr. Knight.

For next Sunday afternoon an interesting bomb-dropping competition will be held, in which both instructors and pupils will compete together in friendly rivalry for two handsome silver cups, amongst the entrants being: Bristol school, Messrs. Merriam and Bendall (instructors); Vickers school, Mr. Knight (instructor), Messrs. Andreae, Mitchell, Paterson and Waterfall (pupils); Mr. Herbert Spencer (instructor), and Mr. Hawker (instructor).

**Bristol School.**—Bendall out first on Monday last week, for solo, then as passenger behind Lieut. Morgan on straights. Afterwards giving Lieut. Noott straight flights. Merriam tested another machine with Capt. Wilson as passenger, and then sat behind this pupil on straights. Afterwards giving similar tuition to Lieut. Duncan on figures of eight. This pupil is much better on his right hand turns. Merriam later, behind Lieut. Morgan, on several straights. Lieut. Broder passed tests for his *brevet* in fine style, landing perfectly. Bendall behind Mr. Grahame Harris on straights. Merriam finished up by taking Mr. Bernard Howard for a high flight over Weybridge, and landing *vol plané* into aerodrome.

After breakfast Merriam for solo, afterwards giving a passenger flight. The conditions were too bad for pupils' work just then. At 5.30 p.m. Merriam and Bendall on several machines for tests, then

the latter giving tuition behind Lieut. Noott, Capt. Wilson, Mr. Richard Powell and Mr. Grahame Harris all on straights. Merriam up behind all these pupils afterwards allowing Capt. Wilson to go alone for first time. He flew four good straights splendidly and landed nicely. Lieut. Duncan also made a capital solo. Bendall and Merriam solo each to finish the evening.

Merriam testing on Tuesday, taking Mr. Richard Powell, and later sitting behind this pupil. Afterwards up behind Mr. Grahame Harris and Lieut. Noott, these pupils then alone for first time, doing very well. Capt. Wilson, after some straights, flew his first circuit in very fine style, the landings being perfect. Lieut. Duncan doing right and left hand turns. Bendall up behind Lieut. Morgan on several straights, he improving splendidly. After storm, Bendall for test, taking Lieut. Noott and afterwards Mr. Richard Powell. Merriam up with Mr. Grahame Harris and Mr. Skene (a new pupil). Darkness put an end to further work.

On Wednesday Bendall for solo, then up with Mr. Skene for figures of eight. Afterwards he took Capt. Wilson, Lieut. Duncan, and then again with Mr. Skene. No flying afterwards through rain, but all busy in the sheds.

Merriam testing machine on Thursday, afterwards out with Mr. Skene, and behind Lieut. Morgan on straights and circuits. Then this pupil out alone flying straights, circuits, and half right hand turns in fine style. Lieut. Duncan away for his *brevet*, finishing half the tests. Capt. Wilson, who has been at the School a week took his ticket in very excellent style. Of course this pupil has had a lot of instruction as he wanted to get away, but throughout he has shown marked aptitude for flying, and went right through without breaking a wire. Bendall tried the air, then afterwards Lieut. Morgan again doing well on half right hand turns, and circuits with very good landings. Merriam up behind Mr. Grahame Harris and Lieut. Noott on straights and circuits, also behind Mr. Richard Powell on left and right hand turns, and landings. Merriam finished up by taking Mr. Skene up to 2,000 ft. for a trip over Weybridge, gliding down into the aerodrome. All pupils are now making rapid progress. Bendall for test in the evening then with Mr. Skene, Lieut. Noott, Lieut. Morgan, Mr. Richard Powell, afterwards Lieut. Morgan going straights and half circuits. Bendall finished by taking Mr. Grahame Harris for a trip.

Bendall first out on Friday, afterwards behind Lieut. Noott, this pupil then alone flying circuits, and making good landings. Lieut. Morgan figures of eight in excellent style. Bendall up with Mr. Skene, Merriam on another machine testing, and later giving Mr. Skene instruction on bank turns, &c. Lieut. Noott made two more good solos. Wind too strong for flying in the afternoon and evening.



**Mr. T. P. Bayetto, who has just secured his Royal Aero Club certificate on a Blériot monoplane, at the Grahame-White Aviation Company's School at Hendon.**



All day wind blowing a gale on Saturday, and flying impossible and attention confined to the machines in the hangars.

**Vickers School.**—Early Monday morning last week, Knight test flight on biplane, with Major Brancker as passenger, then Major Brancker in pilot's seat with Knight behind. Major Brancker straights, with Messrs. Waterfall and Knight alternately behind. Mr. A. Knight (pupil) circuits with Knight behind. This pupil then went for circuits solo, doing very well indeed. Mr. A. Knight right and left hand turns with Mr. Waterfall in back seat. Knight, with Major Brancker in front seat, for straights. In the evening, Barnwell testing No. 2 monoplane. Knight, and then Lieut. Blatherwick, straights on same machine.

Knight test flight on biplane early Tuesday morning with passenger, then with Major Brancker in front seat straights and circuits. Mr. Mitchell solo flight at about 800 ft. Major Brancker, with Mr. Waterfall in back seat, circuits, figures of eight, and landings. Messrs. Waterfall and Orr Paterson solo flights of 10 mins. each. Mr. Orr Paterson circuits, with Mr. Mitchell as passenger. In the evening, Barnwell test flight on biplane, then with Major Brancker in front seat for straights. Mr. A. Knight circuits, with Barnwell in passenger seat. Major Brancker straights, with Knight (pilot) behind. Barnwell circuits with prospective pupil.

Wednesday, Barnwell out on No. 2 mono. early in morning doing circuits and eights. Knight test flight on biplane, then with Major Brancker in front seat. Messrs. Andreae and Mitchell straights on No. 2 mono. Major Brancker with Barnwell behind straights on biplane. Mr. A. Knight with Barnwell behind, circuits and eights. Mr. A. Knight, solo circuits and eights on biplane, doing very well. Major Brancker with Knight behind, straights. Barnwell and then Mr. Andreae straights on No. 2 mono. Mr. A. Knight with Knight (pilot) behind, circuits and good *vol plané*. Mr. Mitchell straights on No. 2 mono. Mr. A. Knight, solo eights and landings on biplane. Mr. Orr Paterson getting just off the ground on his first attempt on monoplane.

Barnwell and Knight test flights, Thursday, on biplane early in morning. Mr. A. Allen Knight then went for his *brevet*, getting through very well with good steady flight at about 200 ft. Knight test flight on No. 2 mono. Major Brancker, with Barnwell and then Knight behind, circuits and *vol plané* on biplane. Mr. Mitchell straights on No. 2 mono. Major Brancker eights and *vol plané* on biplane, with Barnwell behind. Knight circuits with passenger. Mr. Orr Paterson, on No. 2 mono., straights. In the evening, Knight and Barnwell testing biplane, the latter taking a passenger.



Lieut. A. Loftus Bryan (South Irish Horse), who passed for his *brevet* on a 35-h.p. Anzani-Bleriot at Buc last month, and afterwards flew a 50-h.p. Gnome-engined machine.

Capt. Balfour on biplane, with Barnwell behind, for straights. After test flight by Knight, Messrs. Orr Paterson, Waterfall and Mitchell straights on No. 2 mono., in turn. Knight on biplane, circuits with passenger.

Early Friday morning Mr. Mitchell straights on No. 2 mono. Knight on biplane solo, then with Major Brancker in pilot's seat, circuits and landings. Rain then delayed flying for about an hour and a half, after which Major Brancker circuits on biplane with Knight behind. Capt. Balfour straights with Knight behind. Mr. Mitchell on No. 2 mono. straights.

Sunday, Mr. Barnwell out on biplane in afternoon for circuits with passenger.



Mr. E. Whitehouse, with Mr. Ware as passenger, on the Handley Page at Hendon.

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## London Aerodrome, Collindale Avenue, Hendon.

**Grahame-White School.**—Sir A. Sinclair, a new pupil, was out Sunday last week at 5.20 a.m. with Instructor Cheeseman. At 5.35, A. G. Power doing circuits, nearly ready for his *brevet*. 5.50, Sir Bryan Leighton doing circuits. 6.5, R. H. Carr out, who should be taking his *brevet* shortly. These pupils all continued to get practice until late in the morning, about 9 o'clock.

Monday, Sir A. Sinclair out at 6.10 doing straights with Instructor Cheeseman in passenger's seat. He being the only pupil to turn out early, continued practising until 8 o'clock, when he was then doing straights alone, and showing good progress. At 10.30, Lieut. Evill, a new pupil, commenced straights for half an hour, with Instructor Cheeseman in the passenger seat, and continued at intervals during the morning; later, at 11.30, with Instructor Manton. At 12 o'clock, owing to slight wind, school work was discontinued until 4 o'clock in the afternoon, when Lieut. Evill continued doing straights with Instructor Manton. 8.3 p.m., W. Birchenough doing straights.

Tuesday, Sir A. Sinclair out at 5.20 a.m. doing straights alone and making good landings, also Sir Bryan Leighton doing circuits and Lieut. Evill doing straights with Instructor Cheeseman. At 6.50 A. G. Power circuits, showing that he is now almost ready for starting practising on *brevet* machine. Sir A. Sinclair and Sir Bryan Leighton continuing doing solo straights and circuits respectively. At 7.35 Carr doing circuits, getting further practice before going on to *brevet* machine. All pupils continued practising practically all day, including W. Birchenough, who did not start till 11.30. At lunch time school work was suspended until later on in the afternoon, when A. G. Power took over one of the machines at 4.30 and continued doing circuits, while Sir A. Sinclair and R. H. Carr continued getting good practice.

At 7 o'clock, Wednesday, Lieut. Moore, a new pupil, commenced straights with Instructor Cheeseman, followed by A. G. Power, circuits, and Lieut. Evill, straights, with Instructor Cheeseman. R. H. Carr, Sir Bryan Leighton and Lieut. Moore all getting practice continually throughout the morning.

Sir A. Sinclair out at 5.20 a.m., Thursday, doing straights, and Lieut. Moore with Instructor Cheeseman in passenger seat. A. G. Power circuits, also Sir Bryan Leighton. Lieut. Evill straights with Instructor Cheeseman, and Sir A. Sinclair out again at 5.55 doing straights and half-circuits.

Friday.—Sir A. Sinclair and Sir Bryan Leighton getting practice from 7 o'clock to 7.30. Lieut. Evill doing straights with Instructor Cheeseman, afterwards alone. The wind becoming bad in the evening, it did not allow of any school work being done.

Wind still gusty Saturday, thus preventing pupils from getting practice.

**Blériot School.**—Sunday, last week, Mr. Slack was out twice on the 50 Blériot, and then Lieut. Loftus Bryan took the same machine out and flew very well indeed, this being in fact the first time he has flown a 50 Blériot in England. Mr. Hamel and Miss Trehawke Davies meanwhile had flown over to Brooklands on the latter's two-seater.

Capt. Cox, on Monday morning, was rolling well on No. 1 taxi with the tail well up, and accidentally came in contact with a miniature mountain range on the aerodrome which "deteriorated" a front wheel somewhat.

Mr. Reilly, flying No. 3 very nicely, did two circuits and a figure of eight, and is quite ready for his *brevet*. In the evening, Mr. Gandillon did the second half of his *brevet* tests in excellent style, and Mr. Reilly then went up for his, but, unfortunately, owing to engine trouble, was unable to finish; he landed very nicely, with the engine cut out, from 150 ft. Mr. Slack then went for practice on No. 5 for 20 mins., during which time Capt. Cox was making good straight rolls on No. 1. The following day both Capt. Cox and Mr. Williams were doing straight rolls on No. 1 taxi. Mr. Reilly again tried *brevet* tests, but magneto trouble let him down after two figures of eight.

On Wednesday, the first pupil out was Lieut. G. S. Low, who has rejoined the school after 18 months' absence, and who made his reappearance on No. 1 taxi for rolling practice.

On the following day Capt. Cox was out on No. 1, and is showing an improvement in his rudder work. Lieut. Low was also out later on the same machine for rolling.

Friday was only available for school work in the early morning, when Lieut. Low was out again on No. 1, and after doing several good rolls managed to damage a longeron slightly, which put the machine temporarily out of commission.

Saturday, no school work was possible owing to high wind all day.

**British Deperdussin School.**—Monday, last week, in morning Col. Smyth rolling, then straights on No. 2, doing quite good work. Mr. Spratt testing No. 3, fitted with new engine, 10 mins. Machine flew very well. Mr. Hudson and Mr. Bauman then each had 5 mins. straights on same machine. Lieut. Porte had the 100-h.p. out in the evening.

Tuesday, Mr. Hudson 10 mins.; Mr. Bauman, 7 mins. at straight flights on No. 3, both pupils a little shaky in their landings. Fog and wind stopped further work in the morning. Mr. Denis Murray joined and Lieut. Brock rejoined school. In evening Mr. Murray had first lesson, 20 mins. rolling on No. 2. Lieut. Brock rolling and hopping 5 mins., also Col. Smyth and Mr. Jaques. Mr. Bauman couple of straights on No. 3. Mr. Brock tested No. 5 and Mr. Barron had a few minutes at circuits on same machine later.

Too windy for school Wednesday, and next day before breakfast Mr. Hudson 35 mins. straights, circuits and eights on No. 3, doing very well, good landings. He is ready for *brevet* tests now. Mr. Bauman also had 30 mins. at straights, circuits and eights, getting on well. Col. Smyth straights on No. 2. Handles machine well in the air. Lieut. Brock 20 mins. straights on same machine, nice, long, even flights. Mr. Murray and Mr. Jaques 20 mins. rolling on No. 2, the latter much improved, but has not mastered rolling yet.

Col. Smyth, on Friday, 45 mins. straights on No. 2, doing very well. The other pupils thought it too foggy to turn up. Windy in evening.

No school Saturday, wind too strong.

**W. H. Ewen School.**—Good work has been done last week, the weather being very favourable for school practice. On Monday, the school was out at 5 a.m. under the instruction of Mr. L. W. F. Turner and M. Baumann. Mr. Turner after testing the 35-h.p. Caudron No. 1, handed the machine over to Lieut. W. C. Hicks and W. Warren who were doing circuits in good style. M. Baumann made a test flight on the 35-h.p. Caudron No. 2, and then handed machine over to F. W. Goodden, who was doing circuits, while Messrs. George, Jagenberg and Lieut. Bewes were rolling on the same machine. At 6.15 p.m. the pupils were again out under the instruction of M. Baumann, who after a test flight, handed the machine to Messrs. C. George and L. H. Jagenberg, who were making progress in hopping, while Messrs. Gist and Goodden were doing straights and half circuits, and Warren doing circuits in good style.

The pupils were out at 5 a.m. on Tuesday, when M. Baumann, after test-flight on 35-h.p. Caudron, handed the machine to Lieut. W. C. Hicks, who went for his R.Ae.C. certificate, successfully passing the tests in a confident manner. Lieut. Hicks flew his figures of eight with clock-like regularity, banking nicely and landing on the mark. F. W. Goodden was also doing good circuits on the same machine, while Messrs. Pendlebury and Jagenberg were rolling. Monsieur X. was out testing the new 45-h.p. Caudron, getting right away, and doing several circuits before having to come down owing to engine trouble. During the evening, Messrs. Pendlebury and Jagenberg were rolling on the 35-h.p. Caudron under the instruction of M. Baumann.

At 4.30 a.m. on Wednesday the pupils were out, when M. Baumann, after an excellent exhibition flight on the 35-h.p. Caudron, handed the machine to Messrs. Warren and Goodden, who were doing circuits in good style, Mr. Prosser doing straight flights, and Messrs. Pendlebury and Jagenberg also making good progress in straights.

On Thursday school started at 4.15 a.m. M. Baumann made a test flight on the 35-h.p. Caudron No. 1, and then handed the machine to W. Warren, who flew several circuits of the aerodrome in good style, while Lieut. Bewes and Messrs. Jagenberg and Pendlebury were doing straights on the 35-h.p. Caudron No. 2.

M. Baumann made test flight at 4.15 a.m. on Friday on 35-h.p. Caudron, and handed the machine over to Lieut. Bewes and Mr. C. George, who were doing straights in good style.

No school work on Saturday, but at 4.45 a.m. on Sunday Mr. L. W. F. Turner was testing the 35-h.p. Caudron No. 1. He then handed the machine over to F. W. Goodden, who made a number of excellent circuits in good style. Later Mr. Turner was again out on the 60-h.p. Caudron doing excellent solo and passenger work. M. Baumann was also getting good results from pupils on the 35-h.p. Caudron No. 2. After testing the machine, he handed it over to Lieut. Bewes and Messrs. C. George and L. H. Jagenberg, who were making good progress in short flights. Later M. Baumann was up, making a good exhibition flight, flying at an altitude of 2,000 ft., and finishing with a long glide.

**Handley Page School.**—On Tuesday, last week, Mr. Whitehouse out for solo flights on the 50-h.p. monoplane, and on Thursday night with Mr. Fletcher, a pupil, as passenger.

On Sunday several passengers were taken, including Mr. Whitehouse's mother and brother, as well as three other passengers, including one lady.

**Temple School.**—On Monday, last week, after Mr. George L. Temple had tested the air, D. Ritchie was making excellent progress on the Caudron. He was followed by M. Lance, R. Penny, A. Vaile, and Lieut. Maurice Ambler. Later, G. L. Temple was out, flying in splendid style, his switchbacks being especially noticeable. The pupils were again out in the evening, R. Penny and



D. Richie progressing well. G. L. Temple took as passengers in turn M. Lance, Lieut. Ambler, and A. Vaile, later being out solo for 15 mins.

On Tuesday, after testing the Caudron, G. L. Temple handed over to A. Vaile for straights. Mr. Temple later flew alone for 10 mins.

**Willows' Aircraft School.**—Monday last week a balloon ascent was made from Hendon at 5.25 p.m. in 50,000 cubic feet spherical. Accompanied by Mr. Willows' three pupils, Mr. H. Barber, Capt. Bernal, and Mr. R. W. Crocker made a trip of an hour's duration, landing at South Lodge, Enfield. The balloon reascended from there at 7 p.m., with Mr. Valentine (the well-known monoplane pilot) and Capt. L. L. Atherton, a descent being made at 8.30 p.m. at Nazeing, Essex, and the balloon tethered down until midnight.

At 12.30 a night ascent was undertaken with two in the basket, Capt. Atherton and Mr. Willows. A descent was made at 6.30 a.m. Tuesday morning at Pratt's Farm, Little Waltham, near Chelmsford, the balloon being then deflated and packed for the return to Hendon.

#### Salisbury Plain.

**Bristol School.**—Pixton was first up for test on Monday last week, and finding conditions favourable, Lieut.-Col. Hamilton went out for a couple of good solos, as also Mr. De Laplane and Lieut. Burns. Major Hewetson was taken by Pixton for tuition, the pupil being given considerable instruction. Mr. De Laplane made a short solo, which finished up the morning's work.

Major Hewetson was out on a single-seater Bristol monoplane for considerable taxi-ing experience. Busted on Bristol tractor biplane, whilst Pixton took Capt. Kindelanof for a flight in a similar

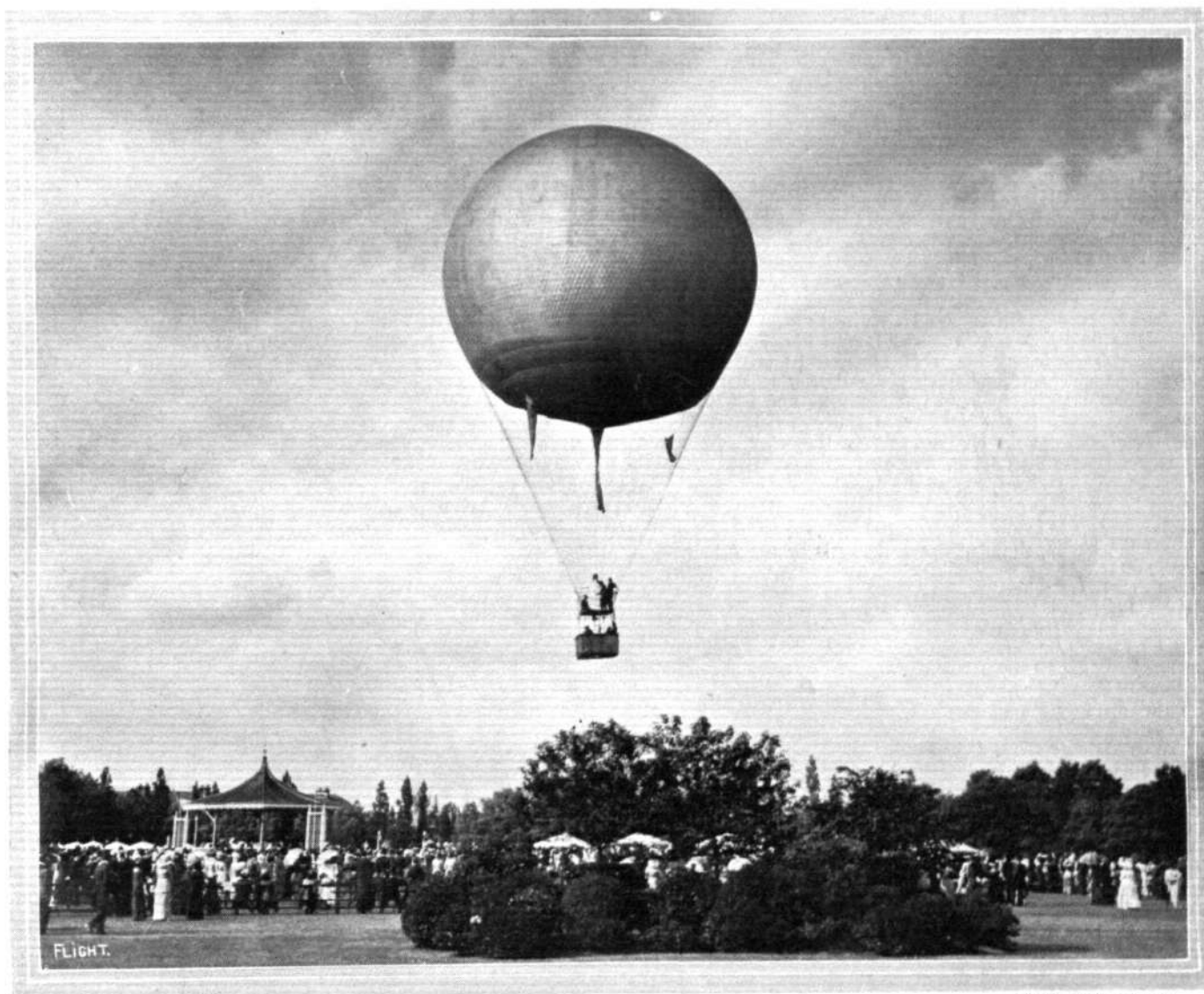
type machine. Pixton then out for tests for pupil's work, Pizey following him for his first solo on one of the new Bristol tractor biplanes, flying well at 2,000 ft. Mr. Gipps was out for two good biplane solos, Busted taking another pupil for two long circuits. Major Hewetson, on a single-seater monoplane, was again out for a number of straights, and Mr. Adams made a very good biplane flight. Pizey then set out for a flight on one of the Bristol tractor biplanes with a passenger, the machine catching fire, pilot and passenger fortunately being unhurt.

On Tuesday, Pixton first out taking Mr. Gipps as passenger, after which good solos were made by Lieut. Burns, Mr. Gipps, and Mr. De Laplane. Lieut.-Col. Hamilton was taken by Pixton for instruction, thick fog then delaying school work for an hour. Lieut.-Col. Hamilton on biplane and Major Hewetson on monoplane were each out for solos. The wind in the evening was too strong to permit of any flying.

Pizey was out first thing Wednesday for a test, afterwards solos were made by the following pupils:—Lieut.-Col. Hamilton, one; Lieut. Burns, one; Mr. De Laplane, one; and Mr. Adams, two. Pizey was out with Mr. De Laplane giving pupil instruction in one of the side-by-side monoplanes, after which Mr. Gilbert (prospective pupil) was taken for a trip by Pizey in the same machine. Rising wind prevented further work.

A fair wind, inclined to be somewhat foggy, first thing Thursday. Pixton up for test, after which solos were carried out by Mr. Gipps and Mr. De Laplane, whilst later on Major Hewetson and Mr. Garnett each made a number of good straights on single-seater monoplanes.

Conditions were excellent in the evening, and capital work was



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**ROYAL AERO CLUB "HARE AND HOUNDS" BALLOON RACE AT RANELAGH.**—The R.F.C. double-decker just off. Major E. M. Mattland (pilot), with Major G. Raleigh, Capt. R. Pigot, Capt. W. S. Brancker, Mr. T. G. Hetherington, Mr. B. H. Barrington Kennett, Mr. R. Hargreaves, and Mr. J. T. Davison (passengers).



done by the pupils. Pixton, with a pupil, made two long circuits, Mr. Garnett doing straights on a monoplane. Mr. De Laplane carried out a remarkably fine biplane solo, reaching 700 ft., and landing well.

Pizey gave tuition on one of the side-by-side monoplanes to Major Hewetson, Mr. Garnett, and Mr. De Laplane, whilst in the meantime Lieut. Burns was out flying very fine circuits, right and left hand turns at 350 ft. Good solos were also made by Lieut.-Col. Hamilton, Lieut. Priestly, R.N., and Lieut. Verdon, R.N. Busted was out for a trip in one of the 80-h.p. monoplanes, followed by Pixton, who had two flights, each pilot made banked turns. Pixton took up a pupil for instruction, and Lieut. Verdon, R.N., finished off the day's work with a solo.

A favourable morning on Friday, and useful amount of work done by pupils. Pizey, in a side-by-side monoplane, gave considerable tuition to Major Hewetson, Mr. Garnett, and Mr. De Laplane. After a trial on one of the biplanes by Pizey, Lieut. Burns and Mr. Adams each made a couple of good solos, whilst Lieut.-Col. Hamilton and Mr. De Laplane made one flight each. All these were long flights at quite a good height, and excellent progress is being made by all the pupils. Major Hewetson and Mr. Garnett put in some useful practice on single-seater monoplanes. Windy weather prevented any further flying all day.

**Royal Flying Corps. No. 3 Squadron.**—On Tuesday of last week there was a deal of out-door work in the evening. Major Higgins, D.S.O., was out on BE 203 with Lieut. Porter as passenger, and then Lieuts. Wadham, Anderson, Porter and Conran each had a trip on the machine. Major Higgins then took up Major Beidworth on BE 204.

Wednesday opened with an ideal morning and the R.F.C. put up some fine flying, first out being Lieut. Porter on BE 203. After he had made a couple of flights Lieut. Wadham took the machine up to 3,000 ft. Major Higgins, Lieuts. Anderson and Conran, were also out. In the evening Lieut. Cholmondeley made three trips on H. Farman 274 for instruction of air mechanics. Lieut. Wadham did similar work on BE 203. Lieuts. Conran, Anderson and Porter were also instructing air mechanics, and Major Higgins took up several officers on BE 204, after which Lieuts. Porter and Conran piloted the machine. The air mechanics instructed were Curtiss, Pearce, Goddard, Pearl, Reeves, Powell, Steed and Bullock.

There was good flying weather on Thursday morning. Lieut. Conran was out on BE 204, after which Lieut. Wadham made three flights on the machine, Lieut. Conran changing over to BE 203. Air-Mechanics Bishop and Mitchell were under instruction. Lieuts. Wadham and Anderson were also using BE 203. In the evening Lieut. Cholmondeley was out on H. Farman 274, and had engine trouble. Lieut. Roupell out on H. Farman 277, Lieut. Wadham three flights on BE 203, followed by Lieuts. Porter and Anderson, the passengers including Major H. Haraguchi and Col. J. T. W. Perowne. Lieut. Anderson then changed over to BE 204, after which Major Higgins took up Capt. Lyster and Sherbrooke on this machine, which was afterwards flown by Lieut. Conran. Sergt. Ridd was out on M. Farman 216. Lieuts. Small, Ashton and Glenwill were also flying, and Air-Mechanics Hobby, Ocken-

dene and Clark were undergoing instruction. Lieut. Conran arrived from Farnborough on the Avro 288, doing his journey in 55 mins.; he afterwards made two flights around the Downs, and Lieut. Porter wound up the day with a couple of flights. The day's flying included no less than 77 flights.

On Friday evening Lieut. Glenwill was out on the M. Farman 216, and then Lieut. Small made a trip round the camp on the machine. Major Higgins was up twice on H. Farman 277 and once on the Avro 288. Lieut. Conran was also flying. Saturday evening, Lieut. Carmichael was out on H. Farman 284 with Air-Mechanic Warland. Major Brooke-Popham on BE 204, Lieut. Anderson and Lieut. Conran on the Avro 288, and Lieut. Porter on BE 203.

The weather on Monday morning was perfect for flying, and work started at 3.30. Lieut. Cholmondeley, after testing the air, going off to Colchester on H. Farman 274. He was followed at 4.40 by Lieut. Carmichael on H. Farman 286 with Air-Mechanic Giddens. Both made the trip safely in just under two hours. At 5.10 Lieut. Allen left for Farnborough on H. Farman 277, followed at 5.24 by Capt. Connor on M. Farman 270.

Lieut. Conran put up a 40-min. flight on the Avro, getting to a height of 3,000 ft., flying around Tisbury, and he followed this by a cross-country flight. Lieut. Glenwill, with Major Brooke-Popham, on M. Farman 216 paid a visit to the Central Flying School. Lieut. Conran on Avro 288 made a fine cross-country flight of two hours' duration. In the evening Lieut. Small, while out on the M. Farman 216, was brought down at Fargo Camp with engine trouble, and in landing broke a tail boom. Lieut. Conran out on the Avro 288.

Tuesday morning, Major Higgins was out on the Avro 288 for 30 mins. flight at a height of 600 ft. On landing, Lieut. Conran put up a good flight, the Avro flying at a height of 1,000 ft. around the Plain. Lieut. Small brought back the M. Farman 216 with an air-mechanic.

## Sussex County Aero Club (Shoreham).

THE Avro 100-h.p. Gnome hydro-aeroplane was flown successfully from the river outside the Shoreham aerodrome, on Wednesday last week, piloted by Mr. Raynham. The length of water between the bridges is 1,300 yards. A start was made a little past half-way, and the machine rose at the first attempt in 10 secs., with passenger, anchor and two hours' fuel, clearing the railway bridge by a good 100 ft. Owing to a sea mist it was impossible to fly at more than 300 ft. Two flights of 10 and 15 mins. were carried out, the machine showing an exceptionally low landing speed.

The next day Mr. Raynham flew to Brighton with Alcock as passenger, arriving at 2,000 ft., and alighting perfectly after many spirals outside Volke's shed, where the machine was anchored without assistance. After a stop to take on board many gallons of castor oil, a start was made, again without assistance, and after both piers and a steamer had received suitable attention at close quarters, a return was made at 1,500 ft.

Flying was finally stopped for the day by a damaged float. On beaching the machine it was found that the bottom of the front watertight compartment had started to give way outwards, apparently due to suction in getting off.

## THE ROYAL FLYING CORPS.

The following appointment was announced by the Admiralty on the 28th ult. :—

Lieut. C. J. L'Estrange-Malone, graded as squadron commander, to date May 1st.

Included in the list of Birthday Honours published on Monday, was the following announcement :—

"The King has been graciously pleased to approve of the under-mentioned officers being promoted by *brevet* for services in connection with the Military Wing, Royal Flying Corps. Dated June 3rd, 1913 :—

"To be Majors: Capt. (temporary Major) Frederick H. Sykes, 15th (the King's) Hussars, commanding the Military Wing. Capt. (temporary Major) Henry R. M. Brooke-Popham, the Oxfordshire and Buckinghamshire Light Infantry, a Squadron Commander. Capt. (temporary Major) Charles J. Burke, the Royal Irish Regiment, a Squadron Commander.

"To be noted for promotion to Brevet Major on attaining the rank of Captain: Lieut. Basil H. Barrington-Kennett, Grenadier Guards, Adjutant, Military Wing. Lieut. (temporary Captain) Herbert R. P. Reynolds, Royal Engineers, a Flight Commander."

The following appointments were announced in the *London Gazette* of the 3rd inst. :—

**R.F.C.—Military Wing.** Major John F. A. Higgins, D.S.O., Royal Artillery, Flight Commander, to be a Squadron Commander. Dated May 30th, 1913.

Capt. George W. P. Dawes, Princess Charlotte of Wales's (Royal

Berkshire Regiment), Flying Officer, to be a Flight Commander. Dated May 30th, 1913.

Lieut. Lancelot C. Rogers-Harrison (since deceased), the Royal Warwickshire Regiment, to be a Flying Officer. Dated April 1st, 1913.

Lieut. Archibald Christie, Royal Artillery, to be a Flying Officer, and to be seconded. Dated April 30th, 1913.

## Protest Against Government Attitude.

At a meeting of the Executive Committee of the National Aerial Defence Association, held at Lord Blyth's residence, 33, Portland Place, on Wednesday last, the action of the Government in refusing, under the provisions of the Aerial Navigation Act, to allow certain competitions to be held, was considered, and the following resolution passed unanimously :—

"Without raising any question as to the principle which underlies the Aerial Navigation Act, the Executive Committee of the National Aerial Defence Association desires emphatically to point out that the operative provisions of the Act as at present administered tend seriously to restrict the development of the British aircraft industry; and earnestly appeal to his Majesty's Government to modify the existing regulations so as to permit British pilots to fly over such parts of prohibited areas as may be necessary for aerial competitions calculated to promote the enlarged production of aeroplanes and hydro-aeroplanes, and to stimulate public interest in aircraft for defence purposes."

## THE KING'S BIRTHDAY ON LAFFAN'S PLAIN.

THERE have been many picturesque ceremonies round about Aldershot in the past, but never before has there been one which appealed to the public as the parade of troops and aeroplanes in honour of His Majesty's Birthday did on Tuesday last, and which they showed in unmistakable manner by the cheers that resounded the length and breadth of the plain.

Laffan's Plain is no small place, but it was hard put to it on Tuesday to accommodate the vast number of troops and visitors that assembled to honour their King on the parade ground, which was perhaps a mile and a half long by three-quarters of a mile wide.

On this enclosure five brigades of troops took part in the parade under the command of Lieut.-Col. Sir Douglas Haig, in addition to a section of the Royal Flying Corps Military Wing, with a fleet of thirteen aeroplanes and two airships. It was a truly magnificent day; real "King's weather" prevailed, the sun seeming to join with mankind in making its bravest show. The sight of so many troops during the march past, all in parade dress with bands playing and colours flying, was a sight to be remembered. Add to this thirteen aeroplanes and two airships, all in the air together, and you have a picture worthy of the brush of a painter.

Precisely at noon, the Union Jack was broken from the flagstaff on Bridge Hill. On this signal the First Heavy Brigade R.G.A. fired a Royal Salute of 21 guns, from a position south of the canal, and with three cheers for His Majesty, and the massed bands playing the National Anthem, every hat came off, and every helmet and busby was hoisted bayonet-high throughout the whole mass of troops.

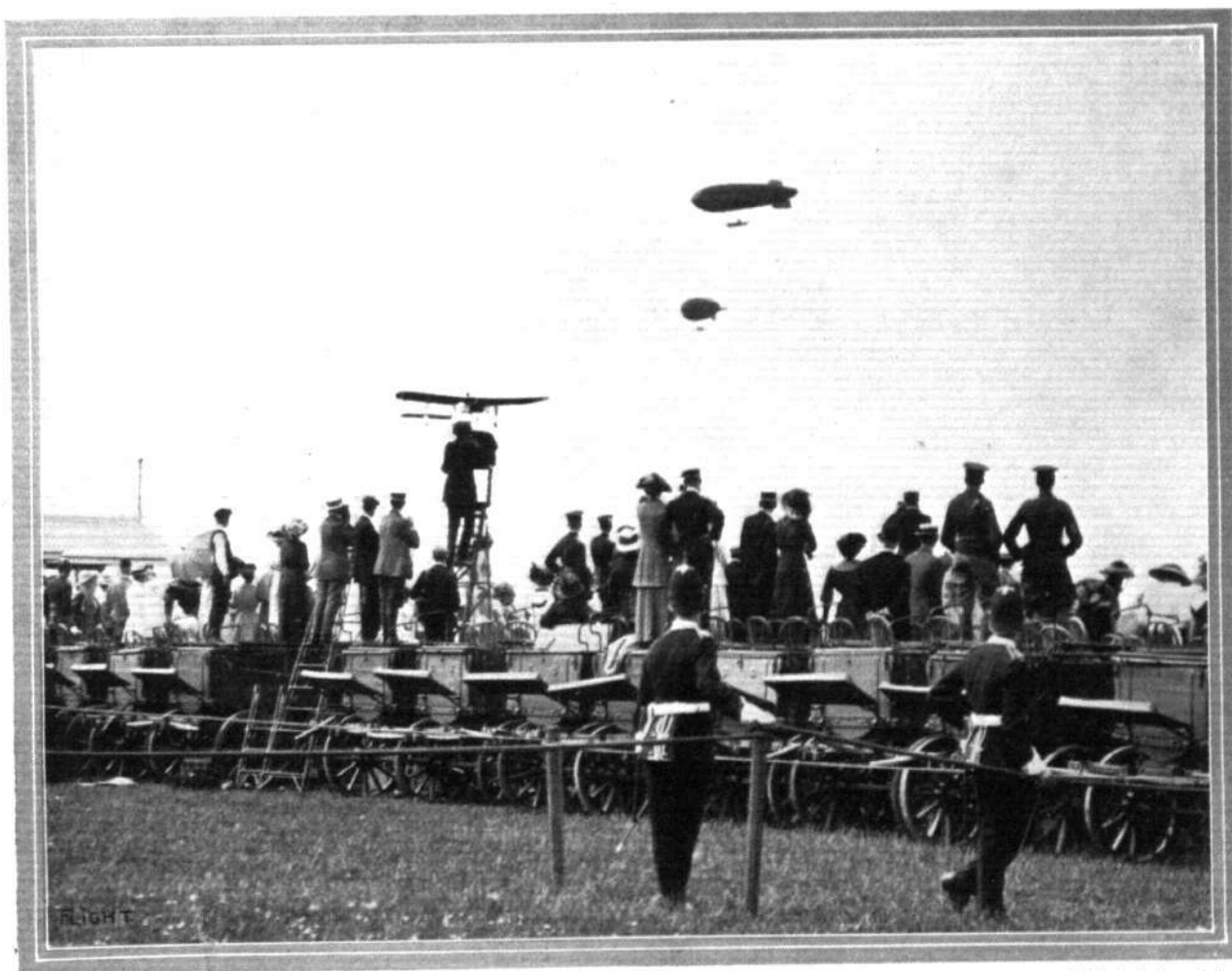
The effect of this simultaneous movement over the whole of the plain was very curious to the onlooker. It seemed as though the mass of humanity had started to grow two or three feet higher in as many seconds, as the thousands of helmets rose with one movement into the air. The troops then took up their formation for the march past, the aeroplanes coming first, and very fine they looked as they "taxied" along one behind the other at intervals of about 50 yards. On the completion of the march

past at a walk, the Cavalry, Royal Horse Artillery, Royal Field Artillery, and 1st Field Troop Royal Engineers trotted past. Then the R.H.A. and Cavalry Brigade galloped past, and finally the Royal Flying Corps, represented by thirteen aeroplanes and two airships—the "Gamma" and the "Beta"—flew past. The machines flew at an altitude of about 150 ft., and each (including the airships) on passing the saluting point, dipped almost to the ground, the graceful way in which the manoeuvre was carried out being very impressive. The airships in particular showed the ease with which they can be handled, descending as they did within a few feet of the earth, and then up again in a gentle sweeping movement.

When the cavalry came past at the gallop the excitement was intense. Everybody seemed bent on shouting themselves hoarse. It is surprising how the rapid movement of a body of troops excites the sporting element in the nature of the English nation. Men threw their hats in the air, and gentle ladies clapped their hands and screamed with delight. Had it been the finish of some great race, the excitement could not have been more intense. Having finished the march past, the troops continued in the direction of Aldershot, and as far as the eye could reach was one mass of scarlet uniforms, intermingled with the glitter of bayonet and sword.

The aircraft taking part in the proceedings were: The "Gamma" and "Beta" airships, four BE-type biplanes, six Maurice Farman, two Henry Farmans, and the I.C.S. Blériot.

During the time the machines were engaged in flying past the saluting point, a rather curious and interesting thing happened. An enormous flock of crows, many thousands strong, came flying along in the opposite direction, at exactly the same altitude as the machines, the pilots having to deviate right and left, over and under the birds to clear. One pilot on a Maurice Farman, evidently wishing to put their composure to the test, flew straight at them, but when within a very few yards had to make a tremendously steep left hand turn and dive. Meanwhile the crows flew on without the slightest concern.



"Flight" Copyright

THE PARADE AT LAFFAN'S PLAIN ON THE KING'S BIRTHDAY.—The "Gamma" and "Beta" in the air together, and the I.C.S. Blériot circling round them.



# BRITISH NOTES OF THE WEEK.

## New British Height Record.

Of the flying seen at Brooklands last Saturday, the outstanding performance was, of course, the splendid climb made by Mr. H. G. Hawker, on the Sopwith tractor biplane. The conditions were by no means favourable, but the 80-h.p. Gnome stuck gamely to its task until a height of 11,450 ft. was shown by the barograph when the carburettor froze and Mr. Hawker was obliged to descend. The return to earth in a spiral *vol plané* only occupied 8 mins. The previous record was Lieut. de Havilland's 10,500 ft., which still remains the British record for pilot and one passenger.

## Honour for Mr. Mervyn O'Gorman.

CONGRATULATIONS to Mr. Mervyn O'Gorman, superintendent of the Royal Aircraft Factory, who in the list of honours conferred on the occasion of His Majesty's birthday, was appointed to be an Ordinary Member of the Civil Division of the Third Class, or Companion of the Most Honourable Order of the Bath.

## Flying at Brighton.

THE engines of the Radley-England waterplane are still at Mr. Volk's station, but the rest of the machine has been taken to Shoreham Aerodrome, where it is being reconstructed. The 'bus should be ready again in three or four weeks' time. The new 100-h.p. Avro waterplane came over last week-end, and surprised everybody with its efficiency, the general belief, as mentioned last week, being that she was underpowered. But this suggestion is quite wrong, as under Raynham she flew well, alighting at the hangar at Paston Place. On the return journey an attempt was made to enter the Shoreham harbour mouth and taxi up to the aerodrome, but there was too much tide, and the floats were subsequently damaged. At the time of writing, they are being strengthened, and by the time these notes appear the 'bus should be back at Brighton, where she will probably be under the control of "Capt. X"—a mysterious German pilot. On Friday of last week, Capt. Dawes and Lieut. Geering twice flew over the town on a Maurice Farman, having previously come from Farnborough. Saturday afternoon Messrs. Pashley went to Worthing on their M. Farman, giving passenger flights to three ladies, one an invalid. An accident might easily have happened on landing, the crowd disregarding the fact that aeroplanes must have room. It was also difficult to get off again, owing to the indifference of the crowd. The public's attention should be called once again to this matter. Nothing more has been done in regard to the proposed calling of a public meeting in Hove for the purpose of organising a subscription for presentation aeroplanes. The Mayor of Hove has promised his co-operation, and further particulars will be forthcoming later.

## Mr. Hucks in Lincolnshire, &c.

DURING the past week Mr. B. C. Hucks, on his 70-h.p. passenger-carrying Blériot monoplane, has carried out further successful flying exhibitions at Sleaford, Peterborough, and Spalding. After giving an interesting display at Sleaford on the 28th ult., he flew across country from that town to Peterborough, a distance of 30 miles, and so strong was the wind that it took him forty-five mins. to accomplish so short a journey. On Friday, the 30th, he was across country again from Peterborough to Spalding, and gave a fine exhibition at the latter town on the Friday and Saturday. At the close of the Saturday flying, he was invited, with his London manager, Mr. J. C. Savage, to an impromptu discussion at the Spalding Club.

On Tuesday of this week Mr. Hucks gave a further demonstration of flying at Spalding, at the conclusion of which he set out across-country for Nottingham, covering a distance of 50 miles in 42 minutes. At Nottingham he remained two days, giving flying exhibitions under the auspices of the Nottinghamshire Agricultural Society. To-day (Saturday) he is flying by special permission of the Marquess of Exeter in the grounds at Barghley Park, Stamford.

## Mr. Hewitt at Rhyl.

ON Sunday last Mr. Vivian Hewitt made a flight of 50 mins. on his rebuilt Blériot. Starting from the Ford aerodrome, he circled over Rhyl and then proceeded along the coast to Abergele, Old Colwyn, Colwyn Bay and Llandudno. He flew over the Little Orme, and, after circling Llandudno three times, returned to Rhyl along the coast. He had a bad time over Rhos, between Colwyn Bay and Llandudno. When flying at about 1,500 ft. along the shore the machine suddenly started to drop, and, in spite of accelerating the engine to its utmost, and pulling the *cloche* back, the machine dropped till within 200 ft. of the water, and then suddenly shot up like a rocket. In coming back the same thing occurred, only as Mr. Hewitt was flying at 2,000 ft., the machine did not get down so close to the water. Altogether the air was very bad, and the pilot had about as

bad a tossing about as anyone could wish to have. On Tuesday, another flight of an hour was made over Rhyl, then on to Prestatyn, Mostyn, Holywell and Shotton, very nearly to Chester. As it began to get dark, Mr. Hewitt climbed very high over Shotton, and cut back to Rhyl and the aerodrome over the tops of the mountains. The mechanics had lighted fires in the aerodrome as it was getting dark, and Mr. Hewitt managed to land safely, making eight steep spirals in coming down.

## Joy Rides With Gordon Bell.

DURING the week-end, Mr. Gordon Bell, who is now flying the Martinsyde monoplane at Brooklands, had the privilege of taking several well-known pilots for an excursion into the "central blue." On Saturday, after he had taken up the lucky people who had drawn the numbers for the free flights in connection with the R.A.C. Associates Meeting, his passenger was Mr. Gordon England. During Sunday afternoon he took up Mr. Barnwell, the Vickers pilot, and on Monday he was accompanied on a 44 mins. trip to Eastchurch by Mr. F. G. Andrae, and on arrival, Commander Samson was taken up for a flight.

## Mr. H. G. Melly at Waterloo.

ON the 28th ult. Melly flew on two-seater round Freshfield Hangars and Formby Golf Club and back to Waterloo by High-town, the flight lasting 25½ mins. at an altitude of 1,600 ft. The flight was terminated with a fine spiral. On the 31st, in rough and showery weather, he was again out on the same machine and did a figure of 8 for the edification of a squadron of Boy Scouts. The engine was missing a bit, which made further flying inadvisable. On the 3rd inst. he was again on same machine, but with a missing engine had to come down after a couple of miles.

## The "Hare and Hounds" Balloon Race.

LONDONERS were reminded of the fact that ballooning is not quite a sport of the past on Saturday, when the competitors in the Royal Aero Club's Hare and Hounds Race drifted across the Metropolis. The "hare," the "Banshee," with Mr. J. D. Dunville as the pilot, got away from Hurlingham soon after 3 o'clock, followed by the five balloons playing the part of hounds. They included the "Chili," piloted by Mr. F. K. McClean; the "R.F.C.," piloted by Major E. M. Maitland; the "Dunlop 1," with Mr. J. Radley in charge; the "Zeta," with Capt. the Hon. Claude Brabazon as pilot; and the "Meteor," piloted by Mr. L. H. Mander. Of these balloons the largest was the R.F.C., which had been manufactured by Messrs. Caudron, Ltd., and was specially interesting from the fact that it had a double-decked basket, and carried no less than eight persons. The high wind which was blowing at the start provided one or two moments of excitement, and the company of Royal Engineers had anything but an easy time. The "Banshee" eventually landed at Sudbury, in Norfolk, and the winner was Mr. James Radley, in Dunlop 1, who brought his balloon down within 200 yards of the "hare."

## A Correction.

THE Grahame-White Aviation Co., Ltd., write to point out that the statement in last week's Official Notices of the Royal Aero Club that Mr. T. Bayetto took his *brevet* at the Blériot school is incorrect. As a matter of fact, he qualified for his certificate on the Blériot monoplane at the Grahame-White Aviation School.



## Perreyon gets the World's Passenger Height Record.

AT Buc, on Tuesday, Perreyon, on a Blériot monoplane fitted with a 160-h.p. Gnome motor succeeded in capturing the world's height record for pilot and one passenger. He took a lady up to a height which was registered by his barograph as 5,100 metres (16,720 feet). The world's record was previously held by Lieut. Blatschke with 4,360 metres.

## Turin to Rome and Back.

DEMONSTRATING the qualities of the 80-h.p. Gnome-Blériot in Italy, Perreyon, on Wednesday week, flew from Turin to Rome and back in one day, the total distance being about 1,200 kiloms. He left the Mirafiori aerodrome, near Turin, at 4.56 a.m., and at 7.57 he landed at Pisa. Restarting at 9.45 he reached Rome at 11.31. Starting from the Italian capital on the return journey at 3.7 p.m. he reached Turin at 8.50, having flown about 1,200 kiloms. in 9½ hours.

## Two other Long Flights in Italy.

ON the previous day two very good performances were put up on Italian-built machines. On an S.I.A. monoplane Deroey left Milan accompanied by a passenger, and he landed at Rome at 10 o'clock. The distance covered was 532 miles. Cevasco also made the journey on the same day, but on a Gabardine monoplane. He, however, went a little out of his way, so making the distance 556 kiloms. Both machines were fitted with 80-h.p. Gnome motors.



# FOREIGN AVIATION NEWS.

## The Pommery Cup Winner.

THE distance flown by Guillaux in his successful attempt for the Pommery Cup has been officially checked and it is found to be 1,229.6 kiloms.

## The Garros-Audemars Match Postponed.

THE elements combined to prevent the great match between Garros and Audemars being held at Juvisy last Sunday, and it was therefore postponed for a week. Not only was there an incessant rain, but the thick mist rendered flying of the type required quite impossible. The events are therefore to be held to-morrow, Sunday.

## The Route for the Pommery Cup.

It appears that the favourite route for the last half-yearly competition for the Pommery Cup will be from Paris to St. Petersburg. At any rate, Guillaux, Brindejonc des Moulinais, Gilbert, Daucourt and Vedrines have announced their intention of flying between the French and Russian capitals. To avoid landing in Germany, it is proposed to make a non-stop run from Nancy to Warsaw, a distance of 930 kiloms.; the distance from Paris to Warsaw is 1,400 kiloms., and from Paris to St. Petersburg, 2,400 kiloms. Gilbert holds the non-stop record of 840 kiloms.

## Delivering Farmans by Air.

HAVING three biplanes to deliver at Etampes, Henry Farman and Bernard and de Ram piloted them from Buc to Etampes on the 26th ult. Each machine had a passenger, Henry Farman being accompanied by his brother Dick. After a rest the three pilots then set out to transport three other machines from Etampes to Chalons Camp and the task was easily accomplished. Maurice Farman and de Larenty Tholozan, each with a passenger, made trips from Buc to Etampes and back.

## America's Representative in Gordon-Bennett.

It is announced that the Deperdussin firm have received an order from the United States for a Deperdussin monocoque fitted with a 160-h.p. Gnome motor, which is to represent America in the next Gordon-Bennett race.

## M. Farman's Week-end Trip.

LEAVING Buc at 6 p.m. on Sunday week, M. Farman, accompanied by Senouque, visited the Touraine district, where photographs were secured of several of the noted castles, &c. By way of Rambouillet, Chartres and Beaugency the voyagers then returned to Chambord, arriving at 7.48. Leaving there the next morning at 5 a.m., the two went to Blois and Chaumont, and landed at Pont Levoy. From there they returned to Buc by way of Montrichard, St. Aignan, the Cher Valley, Orleans, Etampes and Rambouillet. They reached home at 9.30 a.m., and in the two days had covered 800 kiloms.

## Two Hours on a Borel.

AT Albertville, on the 27th ult., Mouthier was flying on his Rhone-Borel monoplane for two hours, and then flew over to Annecy.

## Another Entrant for Michelin Cup.

AS soon as there is a favourable opportunity, Cavalier, who pilots a Rhone-engined Deperdussin, intends to make a trial for the Michelin Cup. On the 28th ult. he flew from Juvisy to Etampes on the machine.

## A Canton-Unné M. Farman.

BEFORE a military commission from Chalais Meudon, Bernard, on the 29th ult., carried out some tests at Buc, with a M. Farman biplane, fitted with a Canton-Unné motor. Among other things, with a full load, the machine climbed 600 metres in five minutes.

## Lieut. Broccard Continues.

ON his Deperdussin-Gnome, with a sapper as passenger, Lieut. Broccard left Lyon at 3 p.m. on the 29th ult., and at 6 o'clock he landed safely at la Maladiere.

## Bielo. Testing a Hanriot.

AT Rheims, on the 30th ult., Bielovucic was testing a Hanriot-Ponnier monoplane with a 60-h.p. Clerget engine. With a useful load of 160 kilogs., the machine mounted 600 metres in 6 mins., and it was at once accepted by the French military authorities.

## Another French Lady Pilot.

THE small band of pilots of the gentler sex in France received another recruit last week, when Mme. Richer completed her qualifying test for an Ae.C.F. certificate at Villacoublay. She used an Astra biplane, and completed her tests without a smash.

## Mme. de Laroche in Another Smash.

ON Tuesday of last week Mme. de Laroche, who has recently been flying a Farman biplane at Buc, was riding in a motor car

driven by M. Vial, when a van collided with the car. Mme. de Laroche was thrown out, but her injuries were fortunately not very serious.

## A Fine Deperdussin Performance.

ON his Deperdussin monoplane, fitted with a 50-60-h.p. 6-cyl. Anzani, Lemoine succeeded in making his tests for a superior *brevet* on the 28th ult. In the morning he went from Villacoublay to Mourmelon and then returned. In the afternoon he made the triangular flight over the course from Villacoublay to Chartres and Orleans and back to Villacoublay.

## More Farman Superior Pilots.

ON the 28th ult., Paret and Lieut. Cassin, on H. Farmans, carried out tests for superior *brevets* over the Etampes-Tours course, and the following day Paret made a 200-kilom. triangular flight over a course from Etampes to Vendome and Chartres and back. Poivre, on a M. Farman, also made a test on the latter course, as also did Dufort. At Buc, on the 30th ult., Capt. Laborde, Lieut. Moris and Sapper Bulteau, completed their superior *brevet* tests on M. Farmans, and at the same school on Saturday last, Doncker and de Bonseray both qualified, while Capt. Bertin, on a H. Farman, flew from Etampes to Chartres and back.

## Long Flights on Sanchez-Bathiat Monoplanes.

AT Mourmelon, on the 26th ult., Berlot was flying his Sanchez-Bathiat monoplane for 1½ hrs., and on Sunday last Robinet was flying a similar machine for 1½ hrs. Lieut. Morel, on his monoplane, flew from Mourmelon to Troyes to visit his parents, and after a stop of only 15 mins. returned, his time for the 180 kiloms. being 2½ hrs.

## Cross-Country Work on Blériots.

LAST Sunday Sapper Thoret on his Blériot went from Pau to Tarbes, returning by way of Lourdes, in an hour and a half, and later in the day in the course of an hour's trip he was over Aire sur Adour. On the 26th ult., Capt. Casse and Lieut. Brule on Blériots went from Pau to Pontoux and back, about 200 kiloms, and Lieut. Hautchamps made a round trip from Pau to Dax and Tarbes and back.

## Villacoublay to Chalons on a Nieuport.

CAPT. GUILLABERT, on his Nieuport, on the 29th ult., went from Villacoublay to Chalons Camp in an hour and a quarter, and the following day he returned to Paris, the second part of the return journey being made through a strong wind with violent *remous*. He flew to Orleans and back on Saturday.

## Fine Work by Borel Pilots.

ON Saturday, Benoist and Clamadieu, on Borel machines, completed their tests for military certificates over a course from Buc to Mourmelon and back. Lieut. Delanney went to Mourmelon and Sergeant Pinsard made a flight of two hours with a passenger. On the previous day Lieut. Personne went to Vichy, stopping on the way at Nevers, while Benoist went to Mailly Camp and back.

## Rheims to Crottoy, &c., on a Dep.

ON the 29th ult., Sapper Hostein on a Deperdussin monoplane arrived at Crottoy from Rheims after stopping *en route* at Lamotte Breuil. He returned the next day, and on Saturday flew from Rheims to Mailly Camp. Sergeant Marinkowitch, on Saturday, also on a Deperdussin, went from Rheims to Amiens.

## More Nieuports for French Army.

AT Mourmelon on Saturday last, Espanet was testing the last of the 100-h.p. Nieuport monoplanes ordered by the French Government as a result of the military aeroplane trials. With a load of 400 kilogs., the machine mounted 500 metres in 6 mins., and in the speed tests the speed was 118 k.p.h.

## Nieuport Superior Pilots.

ON Saturday last Lieut. de Chaulonge made the first test for his military *brevet* by flying from Villacoublay to Chartres and Orleans and back, while Sergt. St. Andre made his last qualifying flight in the direction of St. Etienne, and Sergt. de Marmier went to Chimay, in Belgium. Roume and Lartigue each made a flight of one hour's duration. On the 26th ult. Sergt. de Marmier, with a passenger, flew from Villacoublay to Calais, with a stop at Crottoy.

## One and a Half Hours on a Morane.

AT the Morane school at Villacoublay on Saturday, Lieut. Chevrier was flying for an hour and a half, and Lieut. Premorel made several trips of 40 mins. each.

## High Flying over Paris.

ON his Clerget-engined Clement Bayard, Guillaux returned from Juvisy to Issy on Monday, passing over Paris, for the forty-second time by the way, at a height of 3,500 metres.

## No Flying over Longchamp Races.

OWING to some horses in the paddock being stampeded recently as the result of an aeroplane being flown too close to them, regulations have been made prohibiting flying over the Longchamp Race-course, during a meeting, at a height of less than 1,000 metres.

## Touring on a H. Farman.

ON his H. Farman with an 80-h.p. Rhone motor, Gilbert, accompanied by his wife, flew from Clermont-Ferrand to Etampes on the 28th ult. A stop was made at Cosne in order to accept the invitation of friends to lunch.

## Crotoy to Amiens on a Caudron.

ON the 26th ult., Lieut. Gerard, chief of the French military aviation centre at Crotoy, started from there on his Caudron biplane and flew to Beauvais. From that point he went on to Amiens during the afternoon.

## Rheims to Villacoublay in Company.

TWO officers of the Rheims station, Capt. de Lagarde and Lieut. Dietrich, flew side by side on their 50-h.p. Gnome-Deperdussin single-seated monoplanes from Rheims to Villacoublay, on the 26th ult.

## A Blériot Escadrille in Flight.

A ROUND trip of about 200 kiloms. in the neighbourhood of Pau was made by Capt. Casse, Lieut. Brule and Lieut. Hautschamps, each piloting a Blériot-Gnome machine, on the 27th ult. After leaving Pau, they passed over Pontoux and Tarbes, and had some difficulty in finding their way back owing to the thick mist over the Landes.

## Flying Over the Jura Alps.

VIDART twice flew over the Jura Alps on the 26th ult., when starting from Amberieu on his Rhone-Morane he rose to a height of 2,000 metres, and, flying by way of Nantua and Bellegarde, he passed over Geneva and landed at his old home at Divonne-les-Bains. During the afternoon he returned on his monoplane to Amberieu.

## Fatal Accidents.

ON the 27th ult. Michaelis was fatally injured in a fall from a height of 80 metres at Johannisthal, and on the following day another German aviator, Horn, met his death between Isernhagen and Burgwedol, through his machine capsizing when at a height of 20 metres. While carrying out some experiments in directing the fire of artillery at Bourges on the 30th ult., Lieut. Kreder met with a fatal accident, his machine being caught as he was descending when at a height of 80 metres, and overturned. At Peterhof on Saturday last, a Russian military pilot, Balabuchkin, was killed through the falling of his machine, but his passenger escaped with a broken arm.

## The Johannisthal Meeting.

SOME good flying was seen last week at Johannisthal, although the fatal ending to the accident to Michaelis cast a shadow over the closing days. On the 26th, the quick-landing competition caused several accidents through the pilots bringing their machines down too sharply. The best performance was that of Gasser, who pulled up in 54.5 metres, while J. Janisch was second in 58.7 metres. The height prize was secured by Linnekogel with 2,700 metres, and the duration prize shared by Stiploschek and Stagge with 1 hr. 42 mins. each. The next day a deputation from the Reichstag visited the aerodrome, and witnessed the flying. Wieting won the combined duration and altitude prize for a flight of 98 mins. at 1,340 metres high. The race for light monoplanes was won by Laitsch, who covered the 20 kil. in 12 mins. 56 secs. On the 28th ult., Linnekogel again won the height prize with an altitude of 2,700 metres, and he shared with Wieting the honour of making the longest flight of the day, 2 hrs. 13 mins., although Stiploschek was only 1 min. less. In the getting-away contest, Gouissen was first with 76.9 metres. On the 29th there was another 20 kilom. race, and Laitsch was again the winner, his time being 11 mins. 28 secs. Linnekogel again shared the award for the longest flight, with Pieting, the time being 2 hours 10 mins. On Friday, Linnekogel won the height contest with 2,025 metres, while Laitsch was first in the landing tests, with 49.85 metres, but the longest flight of the day was 1 hour 25 mins. by Wieting. On Saturday, a gale kept all the machines under cover until the evening, when it was just possible to run off the 20 kilom. race for biplanes, the result being a win for Janisch in 14 mins. 56 secs.

## A German Cross-Country Trip.

STARTING from Frankfurt on Monday last, Lieut. Kasener, with Lieut. Wagner as passenger, flew to Butzweiler, close to Cologne, covering the 220 kiloms. in 1 hr. 32 mins.

## The St. Petersburg Meeting.

ON Wednesday of last week the meeting arranged at St. Petersburg in connection with the tercentenary of the accession of the Romanoff House commenced, and some good flying was

done by Lieut. Alexnowitch on the Sykorsky biplane, Capt. Agafo-naff and Kostin on Farmans, Raevsky on a Blériot, and Gaber-Vlinsky and Yankowsky on Nieuports. They were out again on the following day, when the great Sykorsky biplane was flying for half an hour, at a height of 200 metres, with four passengers on board. On the 30th ult. the Grand Duke Alexander Michaelowitch was present at the meeting, and saw Aganonoff take his Farman up to 2,000 metres, while Gaber-Vlinsky, on the Nieuport, reached an altitude of 2,250 metres. Similar flights were carried out on Saturday, when Gaber-Vlinsky went from St. Petersburg to Tsarkoe-Selo and back, and on Sunday some trials with hydro-aeroplanes were carried out over the Little Neva.

## A High-Powered Russian Machine.

AT St. Petersburg, on the 24th ult., Sykorsky gave some exhibition flights on his giant biplane, which is fitted with four motors of 100-h.p. each.

## A New Russian Record.

AT St. Petersburg, on the 23rd ult., Gaber-Vlinsky beat the Russian passenger duration record. He was using a Farman biplane, built in Moscow and fitted with an 80-h.p. Rhone motor, and remained in the air for 3 hours 15 mins. The old record was 2 hours 10 mins.

## M. Farmans for Spain.

AT the Four Winds aerodrome near Madrid, on the 27th ult., Fourny carried out tests with two Maurice Farman biplanes, which were then formally taken over by the Spanish Government.

## Nieuports for Spanish Army.

LAST week Bonnier was at Madrid, and put half a dozen 80-h.p. Nieuports through their paces before they were accepted by Capt. Vives y Vich for the Spanish army. In a 35-mile wind the machines with a full load climbed 500 metres in less than 5 mins.

## A Long Flight in Italy.

ON the 30th ult. Lieut. Poggi, on a Maurice Farman biplane, flew from Neptune to Naples and then on to Rome, covering the 400 kiloms. in 4 hours.



# AIRSHIP NEWS.

## "Lebed" at Work Again.

THE Russian military dirigible "Lebed" recommenced her work on the 24th ult., with a voyage from St. Petersburg to Tsarkoe-Selo, the trip taking three hours, and being carried out at a height of 700 metres.

## An Italian Airship Destroyed.

IN a storm which suddenly arose at Milan, on Saturday, the airship "Uselli" was torn from her moorings and disappeared in the air. The envelope was recovered at Monza, while the nacelle and engines fell a few kiloms. short of that place.

## Wireless Experiments with "Victoria Louise."

ON the 26th ult., the Zeppelin liner "Victoria Louise" made a voyage of 2½ hours' duration from Frankfurt on Main to Aschaffenburg and back for the special purpose of carrying out some experiments in wireless telegraphy. At times the airship was at a height of 1,500 metres, and successfully transmitted wireless messages to Frankfurt.

## Aerial Manœuvres at Cologne.

ON the occasion of the 25th anniversary of the German Emperor's accession next Sunday, the Aero Club of Cologne is to hold aerial manœuvres. Cologne will be supposed to be besieged, and the Governor will attempt to send a message to a relieving force by spherical balloons, while the besieging force will seek to intercept the balloons with aeroplanes. Thirty balloons, five aeroplanes, and a large number of motor cars are to take part in the contest.

## "L 1" Visits Heligoland.

THE first voyage of the naval Zeppelin after her re-inflation was made on the 28th ult. to Heligoland, and after manœuvring above the island for some time the airship continued for some way in the direction of Cuxhaven before returning to her station.

## A Zeppelin to Visit Vienna.

ARRANGEMENTS have at last been made for the long promised visit of a Zeppelin airship to Vienna, and it is stated that the "Sachsen" will make the journey to the Austrian capital from Baden-Baden on Monday.

## The King of Italy in an Airship.

ON Wednesday, King Victor Emmanuel enjoyed a trip of three-quarters of an hour over Lake Bracciano in the military dirigible "P4." The airship manœuvred at a height of about 500 metres, and His Majesty was specially interested in some bomb dropping experiments which were made.



# SCIENTIFIC INSTRUMENTS, THEIR DESIGN AND USE IN AERONAUTICS.

By HORACE DARWIN, M.A., F.R.S.

BEING THE FIRST WILBUR WRIGHT MEMORIAL LECTURE.

(Concluded from page 600.)

## The Principle of Geometrical Design.

We have now discussed some of the difficulties both in designing and using instruments on aeroplanes. We will now consider the general principles of design, and I shall give examples, although these have no connection with aeronautics.

I will quote some remarks made by Clerk Maxwell which should be axioms for those who design and make scientific instruments. He wrote, under the heading of "General Principles of the Construction of Apparatus," as follows\* :—

"There are certain primary requisites, however, which are common to all instruments, and which therefore are to be carefully considered in designing or selecting them. The fundamental principle is, that the construction of the instrument should be adapted to the use that is to be made of it, and, in particular, that the parts intended to be fixed should not be liable to become displaced; that those which ought to be movable should not stick fast; that parts which have to be observed should not be covered up or kept in the dark; and that pieces intended to have a definite form should not be disfigured by warping, straining, or wearing."

As an instrument maker, I know the difficulty of fulfilling these conditions, and, as users of instruments, we all know what our feelings are when a movable part of an instrument sticks fast, and a scale is difficult to read.

Later he says :—

"Each solid piece of an instrument is intended to be either fixed or movable, and to have a certain definite shape. It is acted on by its own weight, and other forces, but it ought not to be subjected to unnecessary stresses, for these not only diminish its strength, but (what for scientific purposes may be much more injurious) they alter its figure, and may, by their unexpected changes during the course of an experiment, produce disturbance or confusion in the observations we have to make."

"We have, therefore, to consider the methods of relieving the pieces of an instrument from unnecessary strain, of securing for the fixed parts a determinate position, and of ensuring that the movable parts shall move freely, yet without shake."

"This we may do by attending to the well-known fact in kinematics—'A rigid body has six degrees of freedom.'"

"In instruments which are exposed to rough usage, it may sometimes be advisable to secure a piece from becoming loose, even at the risk of straining and jamming it; but in apparatus for accurate work it is essential that the bearings of every piece should be properly defined, both in number and in position."

These generalisations cover a much wider field than the construction of scientific apparatus, and in many respects apply to all moving machinery; and designs in which this principle is carried out may be called geometrical designs. A three-legged table is a geometrical

feet. The three-legged table with all its feet touching the floor has some freedom of movement; it can slide in a north and south direction and in an east and west direction, and it can rotate about a vertical axis. If two of its feet only touched the floor, it would have greater freedom of motion, as in addition it can rock about these two feet, and its freedom would be still further increased if only one foot touched the floor. To completely fix it more must be done. If all the feet touch the floor and one foot be pressed against the wall of the room, that foot can no longer move at right-angles to the wall, but it can slide along the wall, and the table can rotate about a vertical axis. If that foot is pressed into the corner of the room all sliding of that foot is prevented, and the table can only rotate, and this is prevented by pressing one of the other feet against one of the walls. These six points of contact, three on the floor and three on the walls, prevent all movement, and this definiteness of position could not be given with less than six points of contact. If we want to prevent an object from moving in any direction, it is best to put a fixed stop with its surface square to the direction of movement; this gives the least pressure against the stop. It also causes the least shift of position due to dust lodging between the foot and the stop. In the case of the table this best condition has been fulfilled. If only one of the feet is moved away from the flat surface against which it was pressing, it will be seen that this movement is perpendicular to that surface. Another example of geometrical design is the method of supporting the trunnions of a transit telescope in two "V"-shaped bearings, giving four points of contact. This allows rotation about the axis of the cylinders forming the trunnions, and also longitudinal motion along the axis of the cylinder, and a fifth point of contact is required to prevent this last movement. A sixth point of contact would be required to prevent rotation—the only remaining motion possible.

Each case has to be worked out according to the movements required in the piece of mechanism which is being designed. When I speak of points of contact, in reality the contact must be between two surfaces, the area depending on the hardness of the material, the forces between them, and the amount of wear that will take place. If the three-legged table had pointed feet it would run into the floor. In many cases also, the contact between the surfaces has to be ensured by pressure from a spring.

## Good Design and Bad Workmanship.

A most important consideration in a good design is that the instrument shall still work well when the rubbing surfaces get worn or parts get bent, or if the workmanship is not good. I am not recommending bad workmanship; the workmanship should be good and so should the design. But I do mean that with perfect workmanship and a bad design, you may get jamming in the moving pieces and bending of parts which should not bend, and

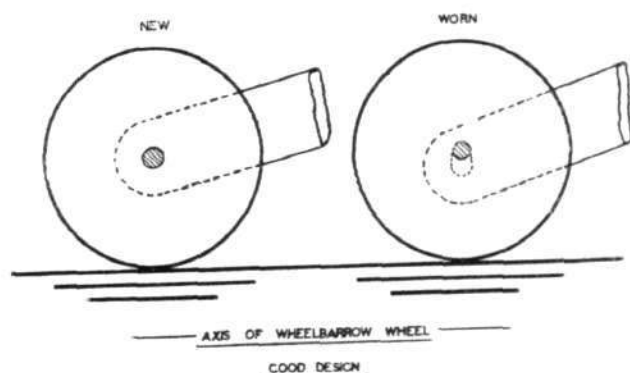


Fig. 6.

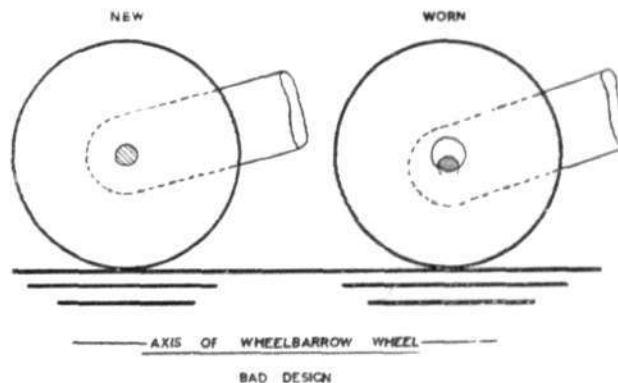


Fig. 7.

design, and a four-legged table is not. A four-legged table either rocks on two legs, or bends so that all legs touch the floor, and the amount of bending and the pressure of each foot on the floor depends on the stiffness of the table and the evenness of the floor. Every time an ordinary chair is placed in a new position, it takes a new shape. A surface plate is a familiar example of the importance of three supports, and nearly all scientific instruments rest on three

\* See Handbook of the Special Loan Collection of Scientific Apparatus in 1876. Introduction by Clerk Maxwell.

the results obtained will be liable to error and the working unsatisfactory. This consideration brings out most forcibly the advantage of geometrical designs, but also it is a valuable test of all designs. It is a long way from being the only test, but it is always well worth while to consider separately the effects of imperfect workmanship, or the bending of each part and wearing of the rubbing surfaces. Take the case of wear in a wheelbarrow. The axle of the wheel usually consists of two round iron pins running in holes in wooden rails forming the frame of the wheelbarrow (Fig. 6).



Both the wood and the pins wear; the pin gets smaller but keeps circular, and wears its way into the wood, and always fits it properly on the side where pressure is taken. The wheel will work perfectly till either the holes break out of the wood or the pin wears down very small and itself gives way. But sometimes the axle is made differently; an iron rod is fixed to the two wooden rails, and passes through a hole bored along the centre of the wheel (Fig. 7).

With use the iron rod wears on the under side and does not remain circular, and the hole in the wheel gets larger; the result is increased friction and a loose and shaky bearing.

I have here an instrument, as an example, the Rocking Microtome, which has been designed as far as possible on the geometrical method. It is used for cutting sections of animal tissue

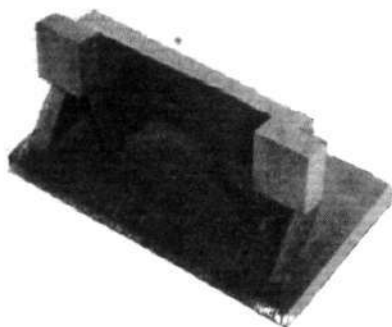


Fig. 8.

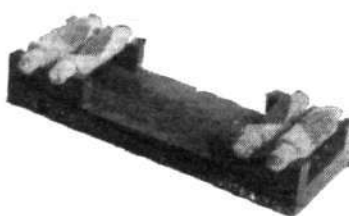


Fig. 9.

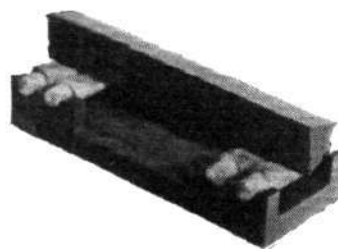


Fig. 10.

for microscopical examination. Sections thinner than 0.003 mm. or 1/8000 in. are cut, and succeeding sections should not vary greatly in thickness. It is clear from this that the instrument must work with considerable precision. The object is embedded in paraffin-wax and moves up and down, the knife, an ordinary razor, being fixed. The rocking arm holding the object to be cut is fed forward between each stroke. I believe this instrument to be a good example of geometrical design. The following test was applied. The iron castings of which it is chiefly made were taken as they left the foundry, and were put together with as little work as possible, and it at once cut good sections, and my expectations were realised by the results of this severe ordeal. I should add, however, that the screw and some other parts were difficult to make badly and were of the usual form and finish.

It is essential that the rocking arm should rotate with great precision about the same axis every time it rocks. This axis is of an unusual form, and Fig. 8 is from a photograph of a wooden model made to illustrate the design. It is a modification of the "V" bearings for trunnions, it is very rigid, and as it is a knife edge bearing it moves with very little friction. There are four knife edges in line; these rest on flat surfaces placed diagonally, and have right-angles cutting edges.

In cases where the rocking movement is small and it is important to reduce the friction as much as possible, another modification can be used with advantage. This is also shown by a photograph of a wooden model (Figs. 9 and 10). Here a hard steel knife is used, resting on four flat steel faces forming part of round steel rods which rest in V-supports. In this construction each flat face supports a quarter of the load, and the centre of pressure acts approximately at the centre of each flat face; and this takes place even when the knife bends more with increased load on it. This arrangement can be roughly made; it will work well, and is an example of the before-mentioned test for good design.

This test for good design is not the only test, and I will give an example to show how it may fail. Ball bearings are much used, and when once used for any purpose they continue to be used more and more; this is the best test of a really good mechanical device. All must admire their design, but first-rate workmanship is essential; in this must be included the composition of the steel, the skill in hardening as well as the accuracy of the figure of the working parts. But a ball bearing would be a better thing even than it is at present if it did not require such fine workmanship. It also requires careful mounting, and it is interesting to notice that the recent improvements in ball-bearing design are in the direction of allowing it to work satisfactorily on shafting which may be considerably bent.

### The Advantage of Reversing the Parts of a Machine.

An improvement in the design of a machine can often be made by reversing the relative position of two parts of it, or the part that moved can be fixed and the part that was fixed can be made to move. This reversal makes it possible to compare two or more methods, and it is then easy to see which is best. It is advantageous that "the survival of the fittest" should take place early in the life of the machine, and by this means, in fact, it takes place before the design is completed.

In a cutting tool it is a question whether the tool or the work should move: sometimes one is best and sometimes the other. In the wheelbarrow it is easy to see which is the best design, and if the designer had deliberately considered whether the iron pins should turn in the wooden rails or whether the iron bar should be fixed, the bad design would never have been made. It is surprising how often this reversal is possible and advantageous, and how difficult it is to realise that it is possible. We are so familiar with a clock in which the frame and works remain at rest and the hands move that it requires a considerable mental wrench to realise that it is possible, and in some cases better, that the clock itself should revolve and the hour hand remain at rest. But in recording apparatus it is usual to fix the clockwork in the rotating drum carrying the paper, and to

prevent rotation of the hour hand spindle. If the clock is at rest, as is usual with clocks, the axis must rotate, but if the axis is fixed the clock itself will be driven round. Another reversal of the usual arrangement is the Gnome engine with its fixed crank and rotating cylinders. I will give one more example of reversing the usual arrangement. In a lathe the tool is usually held rigidly so as to withstand the downward force due to the cut. This force is equal

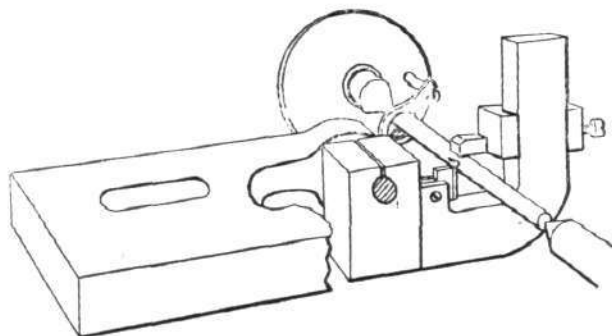


Fig. 11

to the upward force on the work, and the tool and the work are held together by the rigidity of the slide rest, the bed, the head-stock of the lathe and the work. Now in cutting the thread of a fine screw we find it an advantage to carry the tool on a horizontal axis so that the cutting point is free to move up and down, and then to prevent its downward movement by fixing a projecting piece which rests on the top of the work (See Fig. 11). The downward force on the tool is carried to the work by the shortest chain of pieces. The result is the prevention of chatter, good work, and the cutting edge remains sharp for a longer time.

I have spoken as a manufacturer of scientific instruments, but my remarks apply equally or even more to the home-made, or rather laboratory-made, type of instruments. And it is with these that the greatest advances in knowledge have been made. If I could believe that what I have said would be any help to the makers of the wire, cork and sealing-wax class of instruments, or to the orthodox instrument maker, I should be glad to think I had done something to advance knowledge.

Wilbur Wright is honoured in this country as he is by our friends and relations across the Atlantic; by our friends and neighbours across the Channel, and indeed by the whole world.

A new chapter in the history of engineering has been begun. The first page has been written by the man whose name we honour to-night as the pioneer in aviation.

He is gone, but his work will live for all time.

Next week we shall publish a tribute to Wilbur Wright paid by Lieut.-Col. Squier when thanking Mr. Darwin for the above lecture.

# Models

Edited by V. E. JOHNSON, M.A.

## Model Research Work.

MR. R. V. TIVY (Hon. Sec., model section, Bristol and West of England Aero Club), writing in reference to Mr. N. V. Brasnett's letter, May 24th issue, says: "I agree with his remarks. The type of model he condemns is useful, and at present necessary for public demonstrations, and will have to be retained for a time, but the experimental value of a model which has no relation to a practical full-sized machine is nil. Mr. Brasnett makes no adequate suggestion for the development of scientific experimental models."

"I have on several occasions pointed out the fallacy of the registration of 'records,' and in a letter to the K. and M.A.A. on December 31st last, I said 'that quite apart from the question of club distance and duration records which are of little interest and no importance, official observers should be capable of reporting on the behaviour of models in the air, their longitudinal and lateral stability, and should therefore have had considerable experience of model flying themselves.'"

"Public demonstrations with well tried machines are, to a certain extent, necessary, but they must not be confounded with 'research work,' which is something totally different."

"Competitions can be made more useful by the adoption of a marking system. I enclose a programme and judging form of a competition held in Bristol in 1912. The marking system worked well in practice, and although it was rather hard on the judges, there is no doubt that the best machines won the prizes. In this competition the machines competed under numbers, an arrangement necessary to secure impartiality when the competitors are known personally to the judges."

"It is satisfactory to note that distance and duration contests are generally won by well designed models, but one would like to see work of a more practicable and scientific character rather than that of a spectacular nature recognised and encouraged."

The judging form referred to by Mr. Tivy was drawn up on the following plan:—Number of flights, three. Marks, 50 for design and construction, 25 for each; stability, 25; rising, 15; landing, 10; the total maximum for design and construction plus the three flights thus being 200.

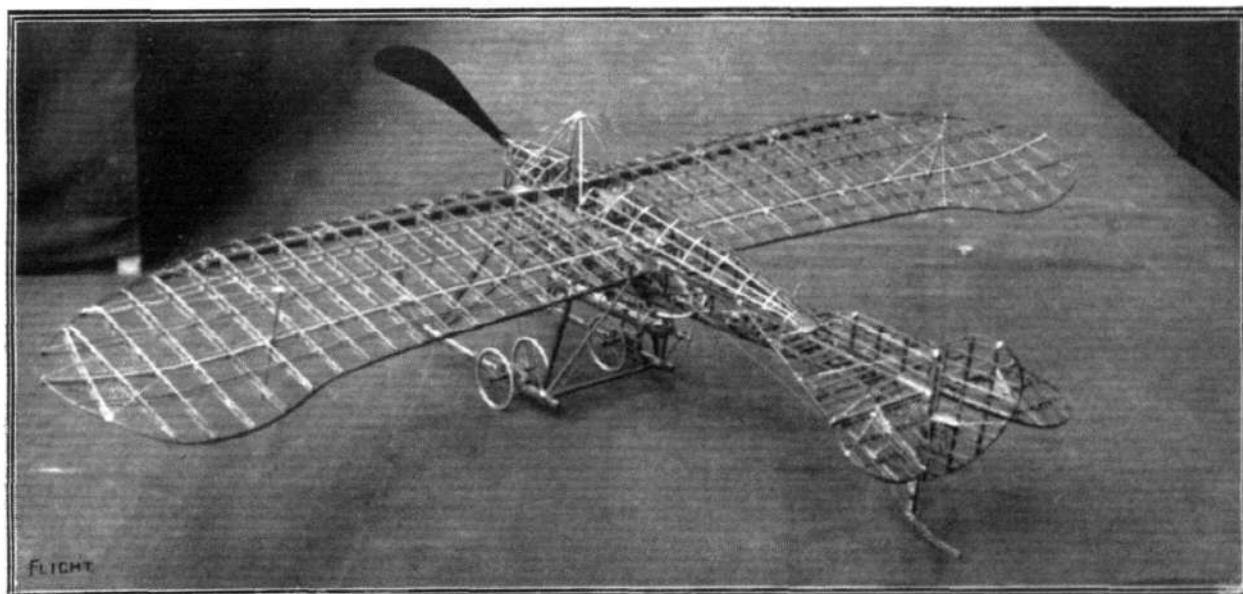
Referring to Mr. Tivy's interesting communication, his remark that Mr. Brasnett makes no adequate suggestion for the development of scientific experimental models, expresses exactly the same thought that at once occurred to the mind of the writer on first reading Mr. Brasnett's letter. There has, during the last year or so, been a considerable amount of talk with reference to scientific model work, but very little in the way of practical suggestions. The matter is one which is not by any means so easy as many seem to think.

"No line," said the late Professor Huxley, "can be drawn between common knowledge of things and scientific knowledge; nor between common reasoning and scientific reasoning. In strictness, all accurate knowledge is science. The method of observation and experiment by which such great results are obtained in science is identically the same as that which is employed by every one every day of his life, but refined and rendered precise. Those who have never tried to observe accurately will be surprised to find how difficult a business it is. There is not one person in a hundred who can describe the commonest occurrence with even an approach to accuracy. That is to say, either he will omit something which did occur and which is of importance, or he will imply and suggest the occurrence of something which he did not actually observe but which he unconsciously infers must have happened. Scientific observation is such as is at once full, precise, and free from unconscious inference."

Probably no man ever lived who was better qualified to make such a statement as the above, viz., that it is not this or that experiment which makes it scientific or non-scientific but the manner in which it is carried out.

Presuming that such a contradiction of terms were possible, a non-scientific experiment scientifically carried out would undoubtedly be far more fruitful of result than a scientific one unscientifically carried out.

We have on more than one occasion been struck by the accuracy of observation of more than one aeromodelist who laid no claim to any theoretical knowledge of aeronautics or scientific training, but who had obtained really good practical results, not, as some say, by the mere method of rule of thumb or trial and error, but by careful and accurate observation of every experiment made by him and correct deductions from the same. Two persons may set out with the same aim in view—to experiment, say, until they have succeeded in making a hand-launched machine of the usual standard type fly a quarter of a mile. Both reach the desired goal. The one possesses a model which has once flown the desired distance, but he fails to accomplish it again, or only does at the rarest intervals, and under the most favourable conditions; the other (who has used to the full his powers of observation) can accomplish it, say, seven or eight times out of twelve. The machines are, let us suppose, very alike in character—both are scientific machines—but the one is a scientific flyer, the other is not. A model is most certainly not wanting in scientific qualifications, because it flies a long distance or makes a good duration. As a matter of fact such a combination as an unscientific model and a good result (of any kind) is absurd. What is often referred to as a "flying-stick" is not an unscientific model, save that such has a somewhat large lateral movement of inertia.



One of Mr. H. H. Ridley's beautifully-made scale (Olympia) models.

"Flight" Copyright.



It is, we think, very important to draw a careful distinction between cause and effect, between the thing and the use to which it may be put. Between real research work such as carried on, say, at the National Physical Laboratory and ordinary model flying there is of course a vast difference, and it is more of such work that is wanted. In the Technical Report of the work done by the staff of the above (1911-12), and which anyone interested can obtain from Messrs. Wyman and Sons, Fetter Lane, E.C., for 11s., the most important paper is probably "The Use of Models in Aeronautics," in which an attempt is made to show how the resistance of a full-sized machine can be obtained from the resistance of its model; and the general idea of what is termed the "Law of Similitude" is explained. It is shown, so far at any rate as practicable purposes go, that the law is correct so far as the lift, &c., of aeroplanes is concerned, and also, in all probability, with respect to their stability and the action of the propellers (provided the speed be not excessive), but that it fails in the case of forms of a streamline character, such as dirigibles, birds, &c. This latter fact is because at present we do not know the real character or nature of the resistance which such bodies experience when moving through the air. Generally they are termed head or form resistance and "skin friction," but we do not know the exact formula for either, or even if there are two really different kinds of resistances at all.

When a shipbuilder has to build a new liner to fulfil certain conditions, say a certain speed, horse power, etc., he is now in the fortunate position of being able to make a model (of his design) in wax, and by drawing it through a water tank, by means of a sort of overhead crane, fitted with suitable recording instruments, at a certain speed, he is able to tell (thanks to the law of similitude in his case), whether his design (as exemplified in his model), is correct or not. If the latter, then he so modifies it until the desired result is obtained, and when such an end has been achieved, he then sets to work on his full-sized boat, with the comforting knowledge that in the ordinary course of events he can accomplish what he has been asked to do, or is able to declare that the conditions asked are such as do not admit of a practical solution.

When the same can be done in aeronautics, then the model will occupy a somewhat higher pedestal than that on which many are inclined to place it at the present day. Research work of such a character as that referred to above not only requires skilled and trained observers but almost invariably a considerable outlay of money as well, and is quite outside ordinary individual or club work. There are, however, minor branches of research work in which some of the clubs could undoubtedly do something, and we shall be very pleased to hear from any club either intending or prepared to undertake such work, as well as a general idea of the nature of the proposed work. There are quite a number of points in Mr. Tivy's communication on which there is much to be said in the way of criticism, and we should like to hear what our readers have to say with respect to them, either for or against.

#### Model Club for Toronto (Canada).

Mr. C. E. Hoole, West End Y.M.C.A., Toronto, would be glad to hear from anyone living in Toronto, with a view to forming a model club out there.

#### Model Club for Wellington.

Mr. A. Humphries (26, Fore Street, Wellington, Somerset) writes, saying: I should be much obliged if you would notify in FLIGHT that a model club has been formed in this town, and that the membership already numbers 15. The club is in negotiation for a club room and workshop. I should be very glad to hear from anyone in the district who may be interested.

## KITE AND MODEL AEROPLANE ASSOCIATION.

### Official Notices.

#### British Model Records.

Hand-launched ...	{ Distance ...	R. Lucas ...	590 yards.
	{ Duration ...	A. F. Houlberg ...	89 secs.
Off ground ...	{ Distance ...	G. Rowlands ...	232 yards.
	{ Duration ...	J. E. Louch ...	68 secs.
Hydro, off water ...	{ Duration ...	F. Whitworth ...	37 secs.
Single-tractor screw, hand-launched ...	{ Distance ...	F. G. Hindsley ...	173 yards.
	{ Duration ...	J. E. Louch ...	68 secs.
Do., off ground ...	{ Duration ...	J. E. Louch ...	45 secs.

Official Trials.—On Saturday, May 31st, the official observers attended Wimbledon Common for the purpose of observing flights for distance and duration for registration and establishing records. The observers were Messrs. F. Mayer, W. H. Akehurst and A. F. Houlberg. The results were:—Distance, hand-launched: R. Lucas (Mann machine), 590 yds.; A. Lewis, 551 yds.; L. F. Hutcheon, 384 yds.; others competed, viz., Hamilton-Fox, F. B. Eads, L. Tucker, &c. Duration off ground: J. E. Louch (North-East London), 54 and 68 secs.; B. Longstaffe (North-East London), 50 and 56 secs.; H. G. Bond (North-East London), 52 secs.; M. Levy (Paddington), 46 secs.; A. Cannell (Paddington), 41 and 46 secs. Single-screw tractor:—Hand-launched duration: J. E. Louch (North-East London), 51, 61 and 68 secs. Off ground duration: J. E. Louch (North-East London), 22 and 45 secs. As will be seen the hand-launched distance record that has stood so long fell to R. Lucas with his Mann machine, he having increased the distance of 477 yds. of A. E. Woollard to 590 yds. Also the off ground record held by A. F. Houlberg of 51 secs. was beaten four times during the afternoon. Both tractor records were

beaten by J. E. Louch, who beat his own record of 44 secs. for hand-launched by 24 secs., and the r.o.g. of 40 secs. by 5 secs.

"Model Engineer" Competition.—This competition takes place this afternoon on Wimbledon Common, on the Plain, Wimbledon side of Windmill, at 3 o'clock sharp. All competitors must report to judges by 2.30.

Hydro. Competition, Welsh Harp, Hendon.—All entries must be sent in to-day, June 7th, last day for receiving entries.

Official Trials.—The next official trials are to be held on the ground of the Hendon Aero Club. Full details, &c., next week, as to route.

International Kite Competition.—A letter from a prominent French gentleman has been received by the President, stating that if an International contest for kites were arranged that at least 11 of the French associations would compete.

Application for Affiliation.—An application for affiliation has been received from the Sheffield Model Aero Club.

27, Victory Road, Wimbledon, S.W.

W. H. AKEHURST, Hon. Sec.

## AFFILIATED MODEL CLUBS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (N. Branch) (25, Church Crescent, Muswell Hill, N.).

June 7th. Monthly competitions postponed to June 14th, 3 p.m. Leytonstone and District Aero Club (64, Leyspring Road.)

June 7th, flying at 3 p.m. June 8th, at 6.30 a.m., model yacht pond; at 10 a.m., near brickfields.

N.E. London Model Ae.C. (57, King Sq., Goswell Rd., E.C.).

A few members flying in Model Engineer competition at Wimbledon. Other members meet Hackney Marshes, June 7th, at 3 p.m.

Paddington and Districts (77, Swindery Road, Wembley).

June 7th, flight golf competition on temporary ground. July 10th, Paddington cup open duration competition on Sudbury ground. Entries close first post July 10th. Entrance fee for non-members, 2s. Intending competitors please note that models must rise under own power. Minimum weight, 4 ozs. Winner to hold cup for year, and retain silver-gilt medal; 2nd receives silver medal; and 3rd bronze medal.

Sheffield Model Aero Club (35, Penrhyn Road, Sheffield).

June 7th, commencement of novices' monthly contests, longest duration, hand-launched, at Standhouse aerodrome, Intake, 3 p.m.; minimum flight, 35 secs. June 9th, special general meeting, club room, 7.30 p.m.; all members please attend.

Wimbledon & District (59B, St. Phillips Rd., Lavender Hill).

June 7th, flying, Wimbledon Common, 3 o'clock; June 8th, 11 and 3 o'clock; June 21st, competition for silver medal, Saturday.

## UNAFFILIATED MODEL CLUB DIARY AND REPORTS.

S. Eastern Model Ae.C. (1, Railway Approach, Brockley).

June 7th, flying at Grove Park, 4.30 to 8.30 p.m.; 8th, at Blackheath, 7.30 to 10 a.m.; at Mitcham, 2.30 to 6 p.m.



### Price of Cellon Reduced.

We learn from the Cellon Co. that they have secured large Government contracts, which have enabled them to enter into contracts for the purchase of the raw materials on very advantageous terms, and by so doing they are able to reduce the price of their famous all-British Cellon Dope to 15s. per gallon. As before they will continue to pay carriage on quantities of 10 gallons and over.



## PUBLICATION RECEIVED.

Bulletin de l'Institut Aerodynamique de Koutchino. Vols. I, II, and III. Moscow, Russia: I. N. Kouchneroff and Cie., Pimenovskaia, 12.



## Aeronautical Patents Published.

Applied for in 1912.

Published June 5th, 1913.

- 11,154. H. HUNTINGTON. Aeroplanes.
- 13,253. SIEMENS SCHUCKERTWERKE GES. Balloon envelopes.
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